LIVING ON OUR EARTH

Whipple & James

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LIVING ON OUR EARTH

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Foreword to the Teacher

This book seeks to provide the beginnings of a study of regional geography. It assumes some knowledge of facts and principles presented in the first two books of the series, *Our Earth* and *Using Our Earth;* but because it reteaches all the geographical terms, except the most elementary, of the preceding two books, it can be used as a first text. It is carefully graded and can be read easily and with understanding by children who are beginning the study of geography.

Geography readiness. *Living on Our Earth* is in no sense a travel-type treatment. It teaches the range of human cultures from simple to complex in areas chosen to illustrate representative regions. In the first eight chapters, seven comparatively simple cultures are presented. The regions studied range from polar to tropical and represent different hemispheres, different continents, different vegetation types, and different ways of gaining a living from the resources of land or sea. Fundamental geographic concepts derived from the studies of simple cultures are then reviewed in a summary chapter. These include relative proportions of land and water, land forms and water forms, surface features, the relationships between the earth and the sun, climate, latitude, population and something of the distribution of people, types of land use, and the beginnings of trade in primitive barter.

A transition book. In the next five chapters the child's ability to think geographically is applied to the study of two particular countries, China and Japan. China is presented chiefly for the following reasons: (1) Within its political borders it provides the variations of climate, land forms, water forms, and vegetation that are desirable for the child's first application of previously learned geographical principles to a large unit, in this case political. (2) China is an overpopulated agricultural country, whose people, with their primitive methods of work, have survived only by dint of great labor and frugality; in China, therefore, relationships between man and the land are peculiarly intimate. (3) China, because it is overpopulated, cannot take care of further population increases without extensive self-transformation in the direction of an industrial economy; and in this enforced transition, China exemplifies humanity's slow change from simple to complex ways of living. Japan affords an excellent illustration of transition, far more rapid and extensive than in the case of China, from a simple farming to a complex industrial civilization. The study of these two countries therefore makes this in the truest sense a transition book in the study of geography.

The last chapter teaches the processes and importance of world trade and also the development of modern transportation.

Map teaching. The maps in *Living on Our Earth* are carefully graded from simple globes, through perspective maps with curved horizons, to the reference map showing both political and physical features. Special maps and diagrams are used to promote ability in map reading and to permit superior visual teaching of geographic concepts. Individual map-reading skills are taught separately and in their order of difficulty. For example, to teach how color may be used to present data of wholly different kinds, the child is shown on page 145 four maps of Africa, on each of which colors mean different things. Using this book, pupils will learn to read standard maps easily and intelligently.

Dynamic visual teaching. The illustrations, closely articulated with the text, have been chosen both for their appeal to the interests of children and for their value in furthering geographic understanding. They actually function in instruction, and the children are carefully taught to interpret them geographically. For example, on page 55 the pupil is given eight exercises in deduction that effectively teach him how to gain geographical information from almost any photograph.

This book aims, therefore, (1) to develop in the child a real interest in geography, through dealing with him on his own level of comprehension; (2) to develop the child's ability to think geographically and to interpret intelligently the landscape and related phenomena about which he hears and reads; and (3) to provide an easy and explicit approach to mastery of maps.

AMERICAN MUSEUM OF NATURAL HISTORY

In the far north, Eskimos get their living by hunting and fishing. This picture shows three Eskimos spearing fish in a stream. It is spring, but the snow and ice have not melted.

In the Southwest of our country lives a tribe of Indians who are herders. These Indians get their living by raising sheep and goats. They use the animals for food and clothing.

KONSTANTIN J. KOSTICH

What This Book Is About

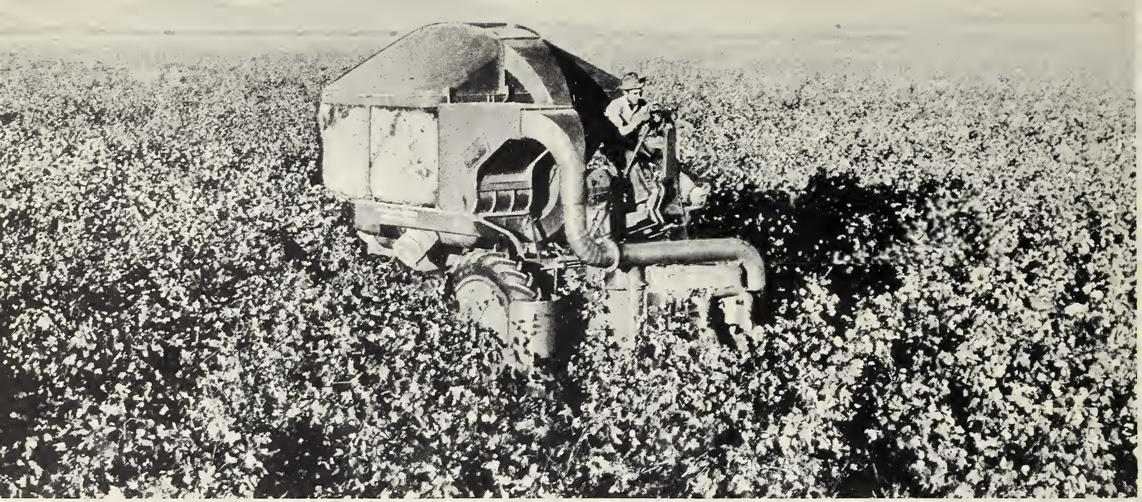
All over the world most grown-up people work for a living. They do hundreds of different kinds of work. Some of these people get their food, clothing, and shelter from the land near their homes. Others obtain many of the things they need from distant places. In this book you will read about people who get their living in many different ways.

Living in simple ways. In a far southern land there are some Indians who get their food by fishing near their homes. These people eat fish and shellfish and almost nothing else. When they can find no more food, they move to another place. They have few possessions to take with them. Everything which they use for food, clothing, or shelter comes from the land or water right around them. They have little to do with other people and depend only on themselves. These people live in a simple way.

Other people get their living by hunting wild animals and by raising half-wild reindeer. They make their homes in small villages scattered over the land. They move several times in a winter because they have to go where they can find new pastures for their reindeer. They dress in reindeer skins. They sleep on these skins. They eat the meat of the reindeer or of polar bears, which they hunt. These Reindeer People have more possessions than do the people who live almost entirely on shellfish. But they too depend on themselves to supply their needs, and they have little to do with people who live in distant places. The Reindeer People also live in a simple way.

Herding animals. In other parts of the world there are people who make their living by raising herds of sheep, goats, or other grazing animals. They eat the meat of these animals, make cheese out of the milk, and make winter clothes out of the hides. Like the Reindeer People some of these herdsmen move their herds about to find new pastures for them at different times of the year. But most of these people do not get any part of their living by hunting or fishing. They depend for their living entirely on their herds.

Subsistence farmers. Many of the people in the world make their living by farming. Some farmers use all the crops



MONKMEYER

On some of the great cotton farms of our country, cotton is gathered by large machines like this one. Many of these farms raise nothing but cotton, which is sold for money.

they raise and have no food to sell. Therefore they receive no money with which to buy things from other people. These farmers grow nearly everything that they and their families use. But most of their farms produce only a bare living. Such a living from a man's own farm is called *subsistence*, and such farmers are *subsistence farmers*.

Commercial farmers. Other farmers plant crops to sell. With the money they obtain from selling their crops, they buy things that other people have grown or made. We say that these farmers are *commercial farmers*. Many commercial farmers keep some of their crops for their own use. Others sell everything they raise.

Some commercial farmers do not grow crops to be used as food for people. Instead they grow crops to feed animals which supply food. These farmers make their living by selling animals or animal products like milk, meat, or hides. Other commercial farmers grow crops to be used in making clothing. For example, cotton may be the only crop raised on certain farms. Most food and clothing come from plants or from animals that eat plants. Almost everything that you eat or wear was either produced by commercial farmers or was made from materials grown on commercial farms.

Living in cities. Many people live close together in cities. These people do not get their food, clothing, and shelter directly from the earth as do people who live in simple ways. The city people earn money with which to buy the things they need. They have many different occupations. Some work in factories. They buy materials which come from many parts of the earth and use machines to make these materials into many different products. Perhaps they spin the hair of animals into thread and then weave the thread into cloth. Or they may make cloth into clothes that are sold in stores. Some city people work in stores selling the things that people need. Others do the work of *transporting*, or carrying, passengers and goods from place to place.

Living in complex ways. With the

EWING GALLOWAY

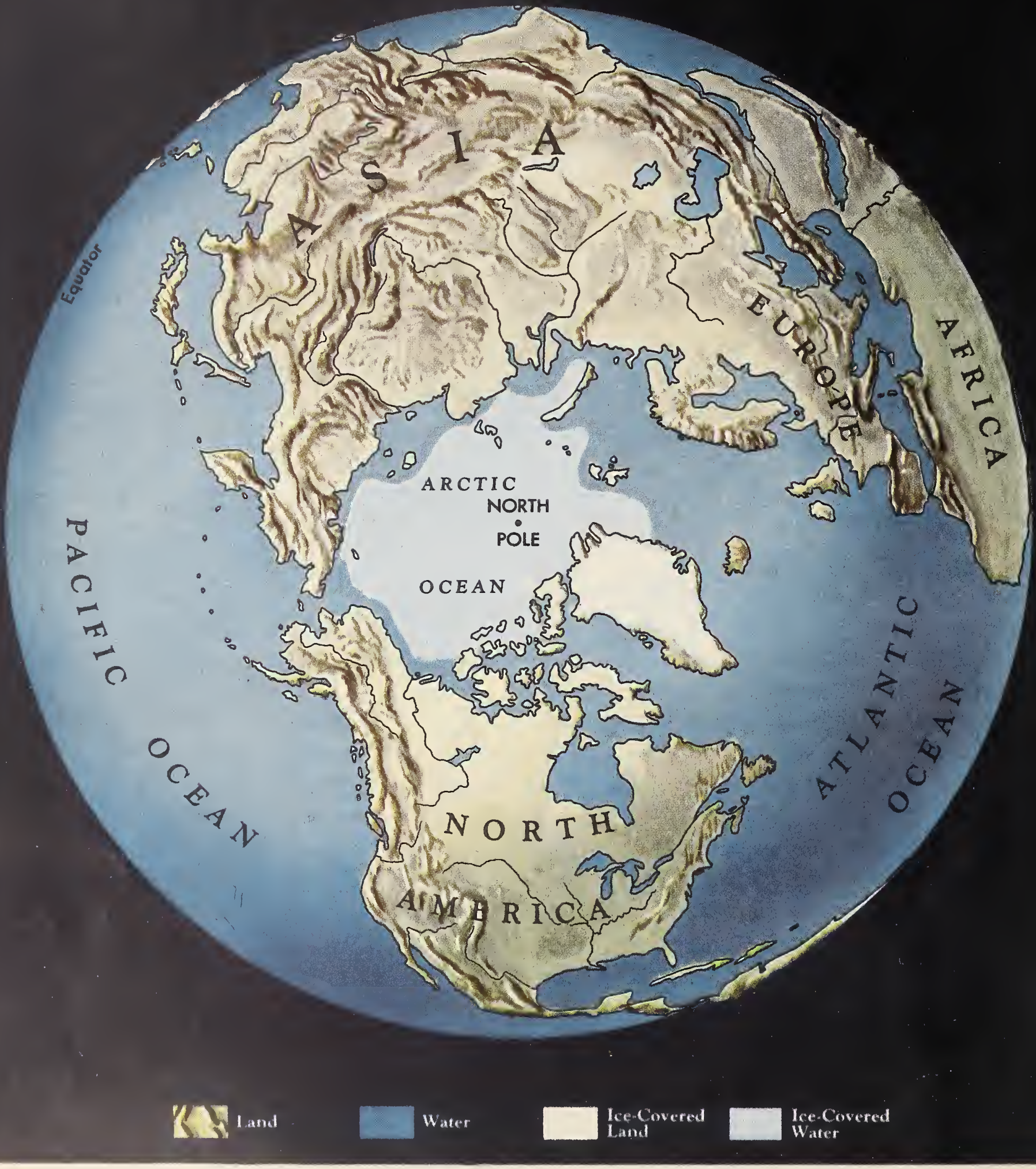
A market in a great city. Food is brought here by trains and trucks and sold to people who keep stores. The storekeepers in turn sell this food to the families in the city.

money which they earn the city people buy the necessities of life. For food they buy fresh fruit, vegetables, meat, fish, or other products which come from many different parts of the world. To build their houses they buy lumber and other materials which may also come from distant places. The materials used in their clothing, or the clothing itself, may have come from far away. For food, clothing, and shelter city people must depend on the work of other people — people whom they have never seen or may know little about. The materials which city people use come from many parts of the earth, not just from the land near their homes. We say that people who depend on others in this manner have a *complex* way of living.

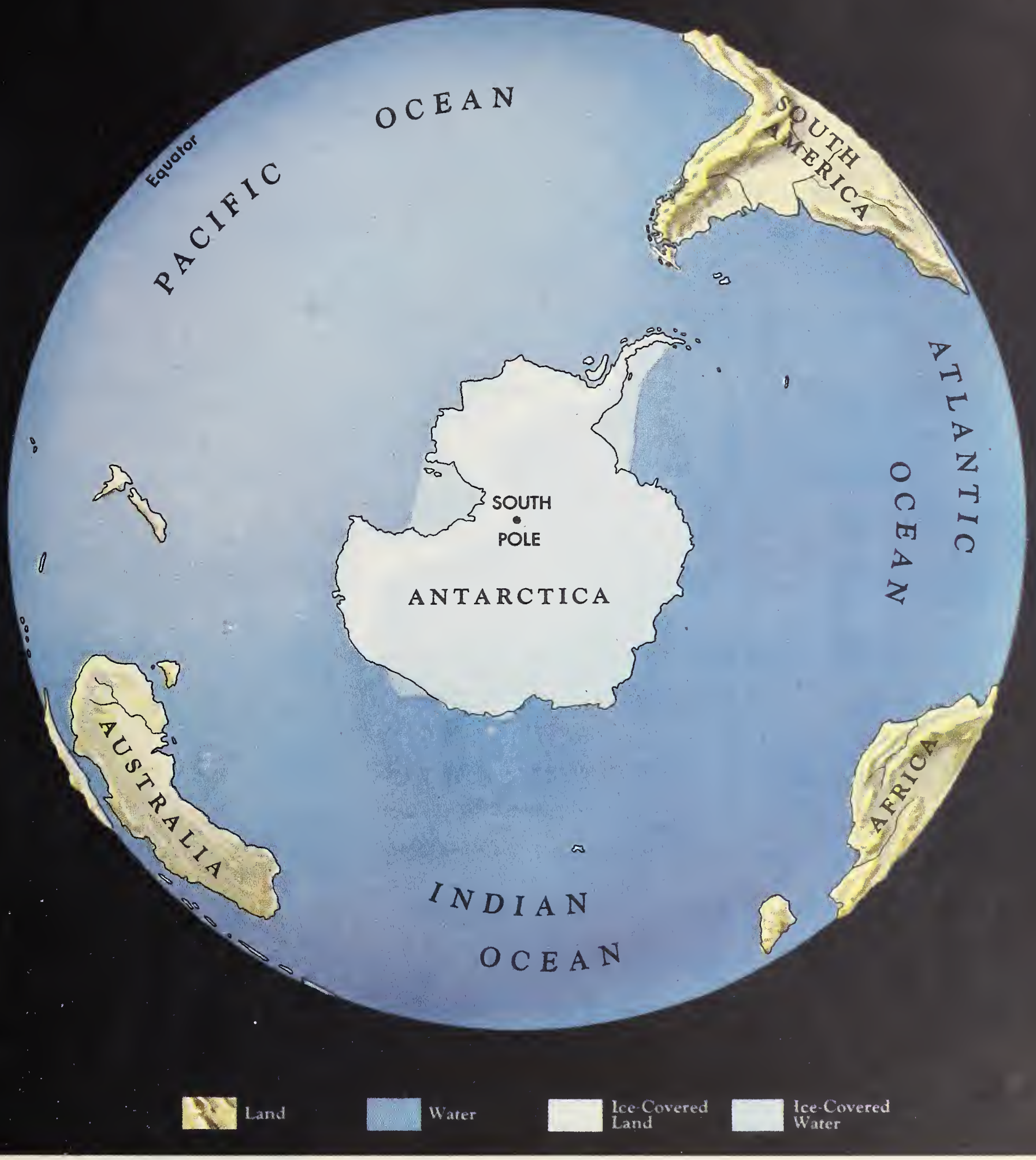
People who live in complex ways have many things which people who live in simple ways do not have. They have much more than just the necessities of life. And if the weather is dry and crops will not grow on the farms near their homes, they do not suffer. If the neighboring land is flooded and the crops are washed away, they will not starve. They receive food from other parts of the world. But if for some reason such as war, ships and trains and airplanes cannot bring goods to the people who live in complex ways, they may suffer. For then they cannot get supplies from the people on whom they depend.

This book tells you about people who live in simple ways. It also tells about some people who live in complex ways. Do you live in a simple way or a complex way? After you have read this book, you should know how you and your family live and how some of the people on whom you depend are living.

Where people live. People, of course, live in quite different parts of the world. Some people live on low, level lands, called *plains*. Such land is often used for growing crops. Other people live in hilly lands where they grow fruit or raise animals. But not so many people live in parts of the world where there are many mountains.



The first globe in this book shows the northern hemisphere, that is, the northern half of our earth. What continents do you see in this hemisphere? Most of the readers of this book live on the continent of North America. On this continent there are mountains, *plateaus*, hills, and plains, as you see on the globe. A plateau is the name that we give to high, level-topped lands. There are high mountains and plateaus in western North America, and low mountains and hills in the east.



Between the two groups of mountains lies a great plain, stretching hundreds of miles across the continent.

The second globe shows the southern hemisphere. In this hemisphere there is much more water than land. What continents do you see here? On some of this land you can see high mountains, low hills, and level plains. What continent is covered with ice? People cannot make their homes and earn a living in this cold land. The kind of land on which

WYATT DAVIS FROM MONKMEYER

A desert in western United States. This land is too dry to grow crops without irrigation. You can see the bare sand and rock. Only a few small bushes and clumps of grass grow here.

people live makes a difference in the way they get their living.

Warm lands and cold lands. Some of the lands on the earth are always warm. The year round, the sun is high in the sky at noon. There is no winter at all. Part of the year is rainy. The other part is dry. It is always warm enough to grow crops, and most crops ripen in a few months. But there are other lands where there is no summer at all. Deep snow and ice cover the land most of the year. Therefore men cannot plant crops there. In some lands there is a short summer after a long winter. In other lands there is a long summer and a cool winter, but it is never very cold.

Rainy lands and dry lands. Some places are so warm and damp that people cannot live there comfortably. Other places are so very dry that they are deserts. Some of the people whom you will read about live in these dry places. But they cannot grow crops in such dry lands unless water is brought to the fields.

In countries where there is plenty of rain, forests grow. Where there is not enough rain for trees, there may be enough for grass. Then the land is a grassland. On other land there is not

KONSTANTIN J. KOSTICH

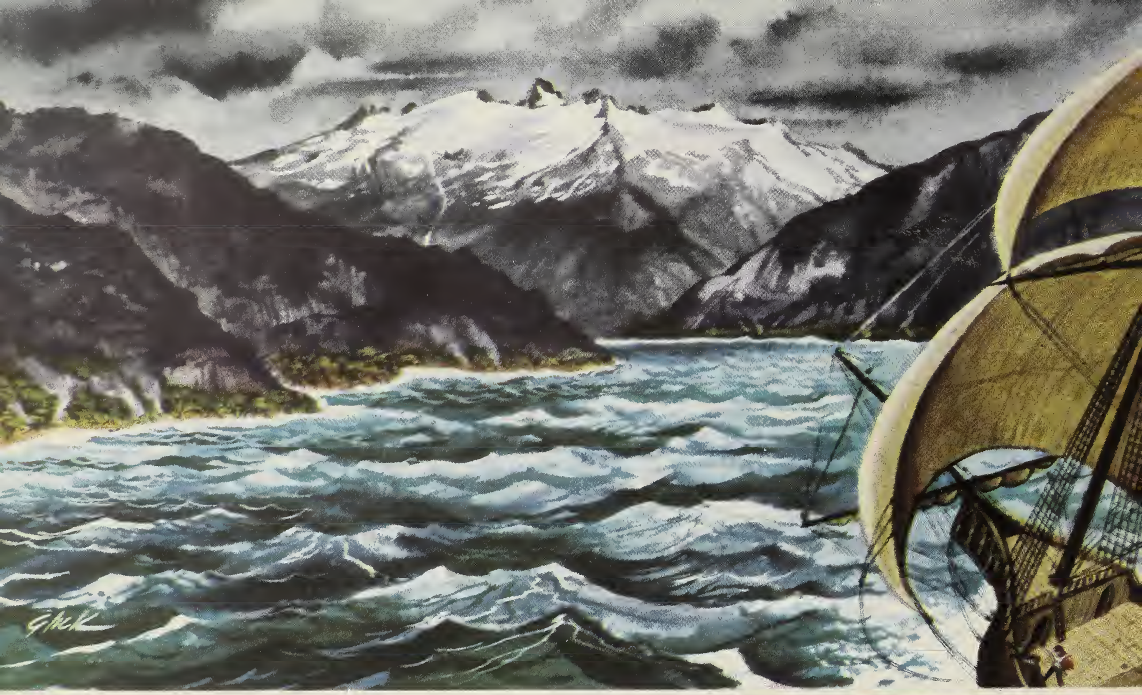
This picture shows a forest on the edge of a grassland. These are hardy trees that need less water than others. Here the land is being used for raising beef cattle for market.

enough rain to keep even grass growing. Only a few scattered shrubs are found in desert lands.

So the earth is quite different from place to place. For this reason people in some places can raise crops which people in other places cannot raise. In no one of our United States, for example, do we raise coffee. Other people who live in warm lands raise coffee for us. These people help us. We also help them, for we pay them money for the part of their crop which they do not use.

People of different lands. This book tells you about many kinds of people who live in distant lands. It tells you how people work and play in these different places. It tells how they get the things which they use from fields or forests or the ocean. It tells about wide oceans and high mountains and level plains. It tells about dry deserts both warm and cold, about hot, rainy forests, and about places so cold that they are never without ice.

It is not easy to live in some of these lands. There are some parts of the earth where men cannot make a living at all. All the people on the earth, you know, get their food, clothing, and shelter from the earth, one way or another, as you do.



Magellan and his sailors were the first white men to see the rocky land of the Canoe People.

The Canoe People

The Land of Fire. More than four hundred years ago a ship captain named Magellan and his sailors were sailing far south in the southern hemisphere. It was a cool, stormy evening, and they passed close to some little islands on which high mountains rose straight up from the sea. Blue smoke was rising here and there against the dark mountainsides. Magellan knew by the smoke that people must live on the islands. The smoke came from their fires. So he and his sailors called the islands the "Land of Fire" or, in their language, Tierra del Fuego. This is the name by which the largest of these islands is known today.

Mountains and forests. The islands were rocky. The slopes of the mountains were covered with forests, which came down almost to the water's edge. Gray clouds covered the sky, and high winds blew the surface of the water into white-capped waves. Because of the storm Magellan and his sailors could not see that trees of mostly one kind, beech trees, grew in that forest. Beech leaves have a brown-green color.

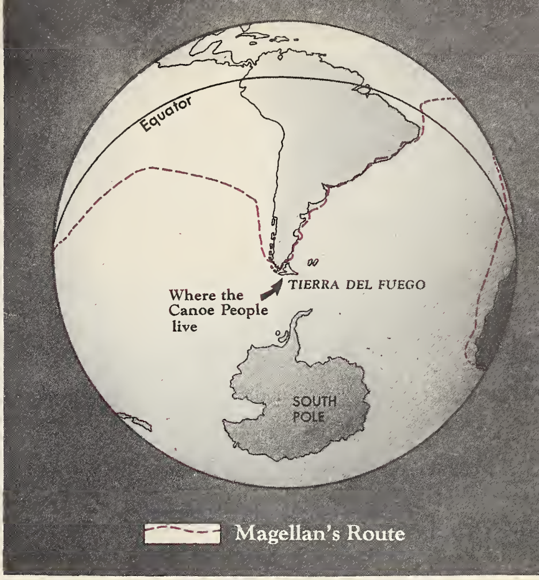
The Canoe People. A tribe of Indians lived in these islands, and some people of that tribe still make their homes there today. They live in wigwams and go about on the water in canoes which they have made. Because they depend so much on their canoes, they are sometimes called the Canoe People. There are no cities in this land, no stores, no automobiles, and no picture shows.

These Indians are short people. Their black hair is coarse and straight and hangs down to their shoulders. They like to put red paint on their bodies. They wear skins of animals to protect themselves from rain and cold. Their dark eyes have red rims, as if their eyes were sore.

Catching fish. The Indian woman goes fishing in her canoe. Her wooden paddle has so short a handle that, as she uses it, one hand is under water. The islands are so small that she can easily go around them.

To catch fish she has a line ten or twelve feet long, perhaps twice as long as a grown man is tall. It sinks into the water because there is a little stone tied to it. It does not have a hook on the end, but a little loop holds the bait.

The Indian woman paddles her canoe to shallow water and drops her line. When a fish seizes the bait, she pulls in the line. She takes the fish from the line and bites off its head in order to kill it. Most of the fish which she catches are small.



Fishing in a storm. The weather is always cool where the Canoe People live, but never very cold. It is often stormy, and the sky is filled with gray rain clouds. While the Indian woman is fishing, she keeps her canoe in the quieter water behind a tiny island. While she waits for a fish to bite, she hears the booming of the waves breaking on the rocky shore.

Sometimes while the Indian woman sits patiently in her canoe, rain begins to fall. She throws an animal skin about her shoulders and keeps on fishing. It is her work to catch the day's supply of fish, and she must stay until she has enough food for her family. Sometimes she dives into the water and swims to get a fish. But the water is so cold that she cannot long bear it, and soon she is forced to get back into her canoe.

Gathering shellfish. But not all the work of gathering food is done by the women. The children and men do their part. Twice a day when the tide is low and there is a broad stretch of wet sand, the men and children go out on the beach and gather shellfish. They go out at night

The Indian woman is fishing from her canoe near the shore. She has just caught a small fish. The man and the little boy are hunting shellfish. The Indians wear skin cloaks.

as well as in the day if low tide comes at night. In shallow water they find little creatures in shells. Some are mussels, and some are like clams or oysters, which you may have eaten. The children find little animals like snails sticking to the rocks. The Indians put the shellfish into baskets which they have brought with them.

The Indians did not buy their baskets at a store. The women made them from wild grass that grows on the islands. They picked the grass and carried it to their camp. They flattened the round stems of the grass between their teeth to make it easy to work with. Then the women wove the grass into baskets and dried the baskets over a fire.

The Indians live on fish and shellfish. They break open the shells with a smooth stone and eat the shellfish raw. Sometimes they cook their food by putting it on hot stones. When they place mussels or clams on the stones, the shells will open. But it is hard to find food in the islands where the Canoe People live, and there are times when they must go hungry.

A great feast. Once in a while a large sea animal, called a whale, comes into shallow water and then is not able to get away. The Canoe People kill the whale with spears. They are happy, for now they can have a feast. They build a big fire on the shore. When other Indians see the fire, they know that they are invited to eat some of the whale meat. All the families near by come to the feast. They cut thick slices of fat and meat off the huge animal.

The whale is so large that all can have enough to eat. The meat which is left is buried in the ground. A hole is dug, and thick pieces of whale fat are put into the hiding place. Later when the Indians can find nothing else to eat, they dig up the pieces of whale and eat them.

Day after day the Indians search for shellfish. They eat the animals and toss the shells in a pile. When the Indians cannot find any more shellfish, they leave for a new fishing ground. The piles of shells are left behind. After a while plants

Traveling in the canoe to a new home. The mother paddles while the father watches for fish. The little boy tends the fire, but now he is trying to see if there are any fish in the water.

begin to grow over these piles, making them look like small hills. All through the islands where the Canoe People live you can see such piles.

Moving camp. It is not hard for the Canoe People to move their camp. They take very little along with them. They have few clothes and no furniture to move. They own only a few baskets, stone hatchets, spears for killing whales, and shells which they use for dishes. Perhaps they have a few pieces of whale fat to take with them. Because the Indians move from place to place to find food, we say that they are *nomads*. This means that they have no lasting home. People who do not remain long in one place are called *nomadic* people.

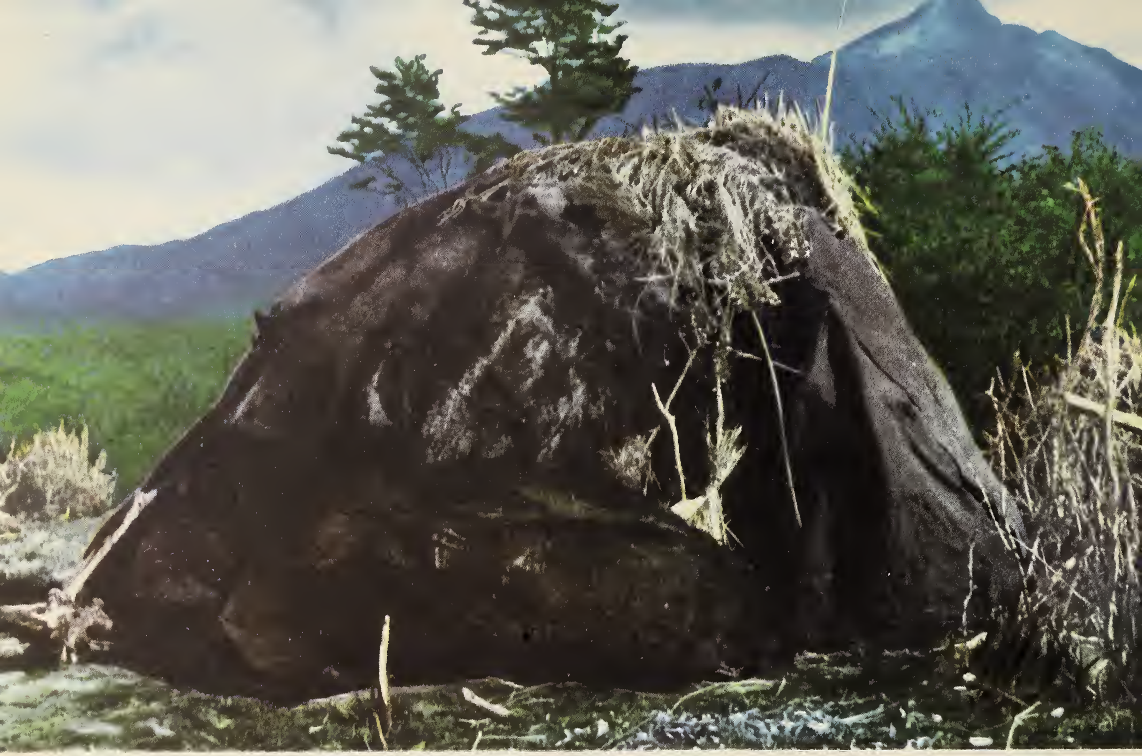
When the Canoe People move, they do not often travel over land. The rocky cliffs come down close to the shore. There are no horses or wagons to carry their possessions. There are no automobiles or railroads on these islands. The families go by water in their canoes.

Loading the canoe. Each canoe is big enough to hold one family and its few possessions. The animal skins and tools are put in first. In the middle of the canoe the Indian woman puts a flat piece of clay, on which her fire is burning. The Indians start their fires by striking sparks from two stones. This is not easy, so they carry their fire with them.

The woman sits at one end of the canoe. She pulls hard on the paddle to move the canoe through the waves. Her husband rides at the other end. He holds his spear in his hand ready to catch any fish that he may see. The little Indian boy sits near the middle of the canoe.

Finding a new home. As the canoe moves along, the woman watches for a level place on the beach where a wigwam can be built. Since the mountains come down close to the edge of the water, there is not much level ground. After a while the Indians see an old camping place where other families once lived. There are piles of shells over which green plants are growing. The mother paddles near.

The man and little boy step ashore.



EWING GALLOWAY

A wigwam made of poles covered with grass and sealskins. Notice the seashells in front of the wigwam. When the Indians move, they will leave nothing behind them but the shells.

They unload the fire and their few possessions. The mother then paddles the canoe to a place where thick seaweed grows in the shallow water. She leaves the canoe there, where the waves will not harm it. Then she swims ashore. The Indian father cannot swim.

Making camp. When the Indians have landed on the beach, the man prepares to build a new wigwam. He tries to find a spot that is sheltered from the cold wind. Since the family will stay there only a few days, the man does not spend much time making a wigwam. He uses branches of trees, some grass, and a few skins.

To make a frame for the wigwam he sticks beech boughs into the ground in a circle. Then he bends their ends toward the middle until they meet. He fastens the ends together by weaving short sticks in and out and tying them to the boughs. He fastens all the boughs at the top. Then he covers this frame with skins and bark and grass. Inside the wigwam he digs a hole for the fire. Since there is no hole in the roof, the home is a smoky place to live in. This is why the Indians' eyes are so red.

If the man has no skins for a wigwam, he may build only one wall to keep off the wind, or he may not build a shelter at all. Then at night the Indians curl themselves up on the ground and sleep like animals.

Gathering food. On the high cliffs near the beach some birds have built their nests. The Indians use birds' eggs for food. They know that there will be eggs in the nests. But the cliffs are steep, and it is dangerous to climb them. Since the mother can climb as well as she can swim, she goes after the eggs and brings them down without breaking them.

At night an Indian often paddles to a rock where birds are perching, asleep. He quietly snatches one bird at a time and twists off its head. Sometimes he makes a trap to catch birds, or he brings down flying birds with a sling made of wood and skin.

After a few days all the shellfish have been gathered from the near-by shores. The Indians again pick up their belongings and move on in their canoes to another beach. They must find a fresh supply of food. Maybe later they will come back to the beaches where they have lived before. After a time more shellfish will grow on the rocks. Then the Indians will again be able to find plenty of food there.

Skin clothing. The little boy wears an animal skin hanging around one shoulder like a cape. The skin, which came from a seal, hangs to his waist. Seals live mostly in the cold oceans and eat fish and other sea animals. Seals have *flippers* instead of legs and are good swimmers and divers. Sometimes they are seen on cakes of floating ice. Sometimes they lie on the shore or on the rocks near the shore. The Indians hunt them with spears.

The boy's body and legs are bare, and he wears no shoes today. Sometimes he wears moccasins made of sealskin. When the wind blows from one side, he throws his sealskin cape to that side. If the wind

Seals and birds near Tierra del Fuego. The Canoe People spear the seals for meat and skins, and gather the birds' eggs. But the Canoe People live mostly on fish and shellfish.

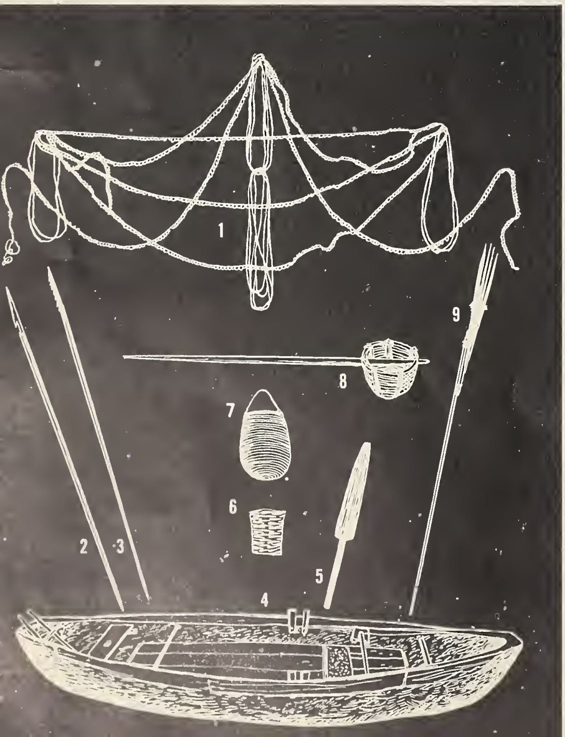
EWING GALLOWAY

changes and blows from the opposite direction, he puts the cape on his other shoulder. The Indian men and women also wear capes, but even when the wind is cold, they do not shiver. The Indians rub grease on their bodies. Then when it rains, the water runs off, and they are not too uncomfortable from the cold.

Indian canoes. These people spend much more time in building a canoe than in making a wigwam. The canoe must be strong, and big enough to hold the family and its belongings.

The Indians used to build their canoes of bark from beech trees. The father would cut large pieces of the bark with his stone hatchet and sew them together. The bark canoes were easy to make, but often they would leak. They would break if they hit against rocks in a storm. They might be upset by *gales*. Gales are strong winds.

This drawing shows some of the articles which the Canoe People use to get their living. By number the articles are as follows: 1, fishlines. 2, and 3, spears for seals. 4, a dugout canoe. 5, a short-handled paddle. 6, 7, and 8, woven baskets. 9, a four-pointed fish spear.



Because gales often blow over these islands, the Canoe People needed canoes made of stronger material than bark. They found that they could make very strong dugout canoes from the trunks of beech trees. But gales are sometimes dangerous to the Canoe People even when they are in dugout canoes. A gale may blow an Indian toward a bare island and wash his boat up on the shore. He may have to stay there for days or weeks until the wind and waves die down. Gales come up very suddenly in this part of the world.

Oceans. The water on which these Indians travel is a small part of the great world ocean that covers much of the surface of our earth. If you will look closely at the globes on pages 4 and 5, you will see that there is a great deal more water than land. In fact, the continents are really huge islands in the ocean. Great ships that cross the ocean go for days and days without even coming in sight of land.

Each part of this world ocean has its own name and is called a separate ocean. Look at the Pacific Ocean on both globes. It is the largest ocean of all. Find the Atlantic Ocean. This is the great ocean that Columbus crossed when he discovered America. Find the Indian Ocean. It is the third of the great oceans of the world. What is the fourth ocean named on these globes?

Notice on your globe that no ocean is separate from the others. All join one another. A ship could sail from one of them to any other. This is why we say there is one great world ocean.

JAMES SAWDERS — COMBINE

The mass of snow and ice is so large that the ship near it looks very tiny. Notice the long cracks in the ice. The ship will soon move away because of the danger of falling ice.

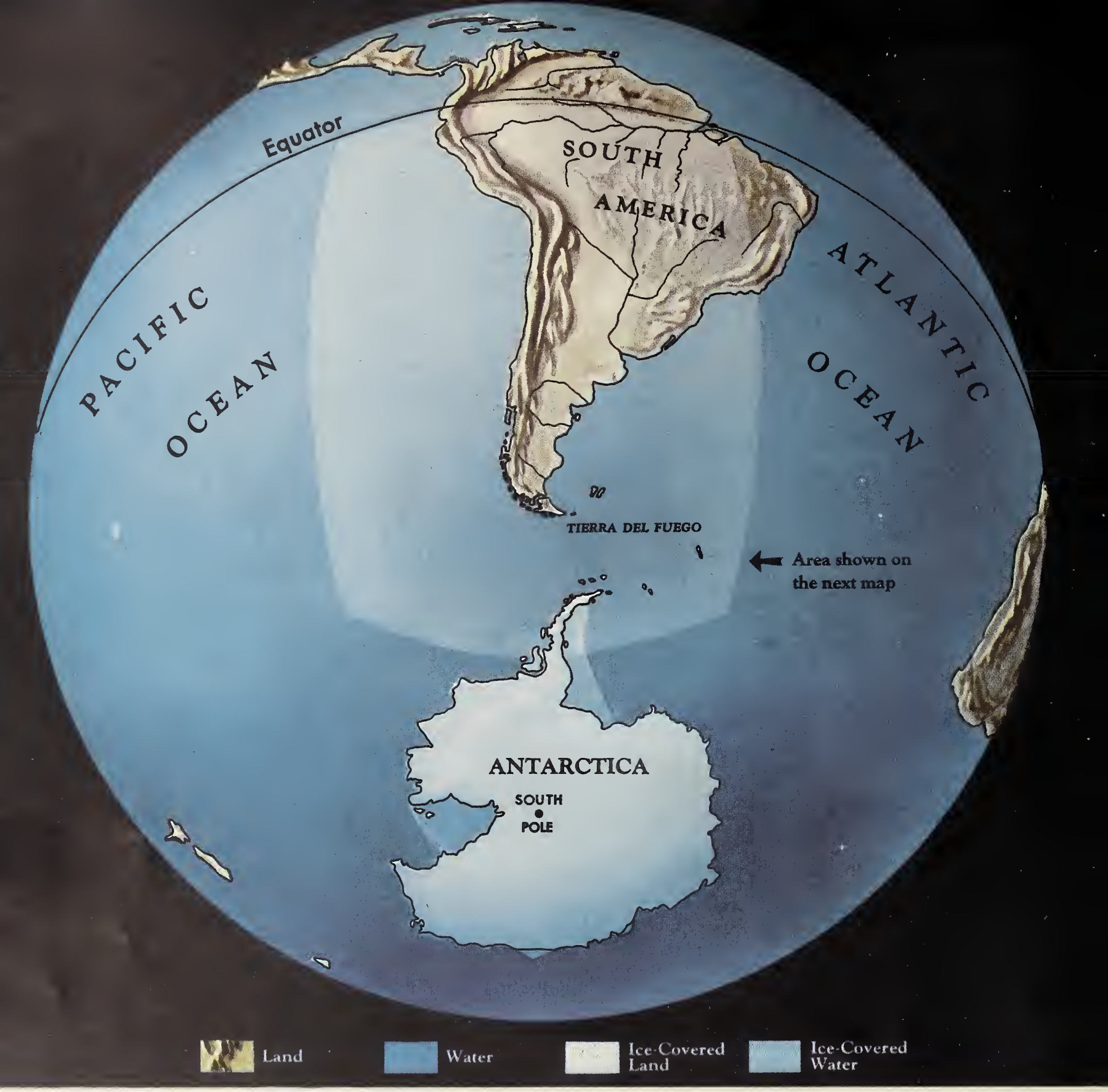
THE LAND OF THE CANOE PEOPLE

A land of storms. Tierra del Fuego is one of the stormiest places in all the world. The weather is almost always stormy. There are few hours of sunshine and few hours when the wind is not blowing. It is usually cloudy and wet. In winter, which comes at the same time as our summer, the weather is often snowy and sleety. The winters and summers are much alike, though the winds are stronger in winter. There is no very cold weather and no hot weather.

The ground on the islands is covered with rocks. The tops of many of the mountains are covered with snow and ice. In some parts of the mountains the snow piles up so deep that it moves very slowly down the slopes and through the valley toward the sea. When it reaches the sea, large pieces of ice may break off and float in the ocean. The Indians have to be careful not to paddle their boats where there is danger of ice falling into the water.

The weather is so cool and stormy that no crops can be grown in this part of the world. The Canoe People do not know how to plant crops.

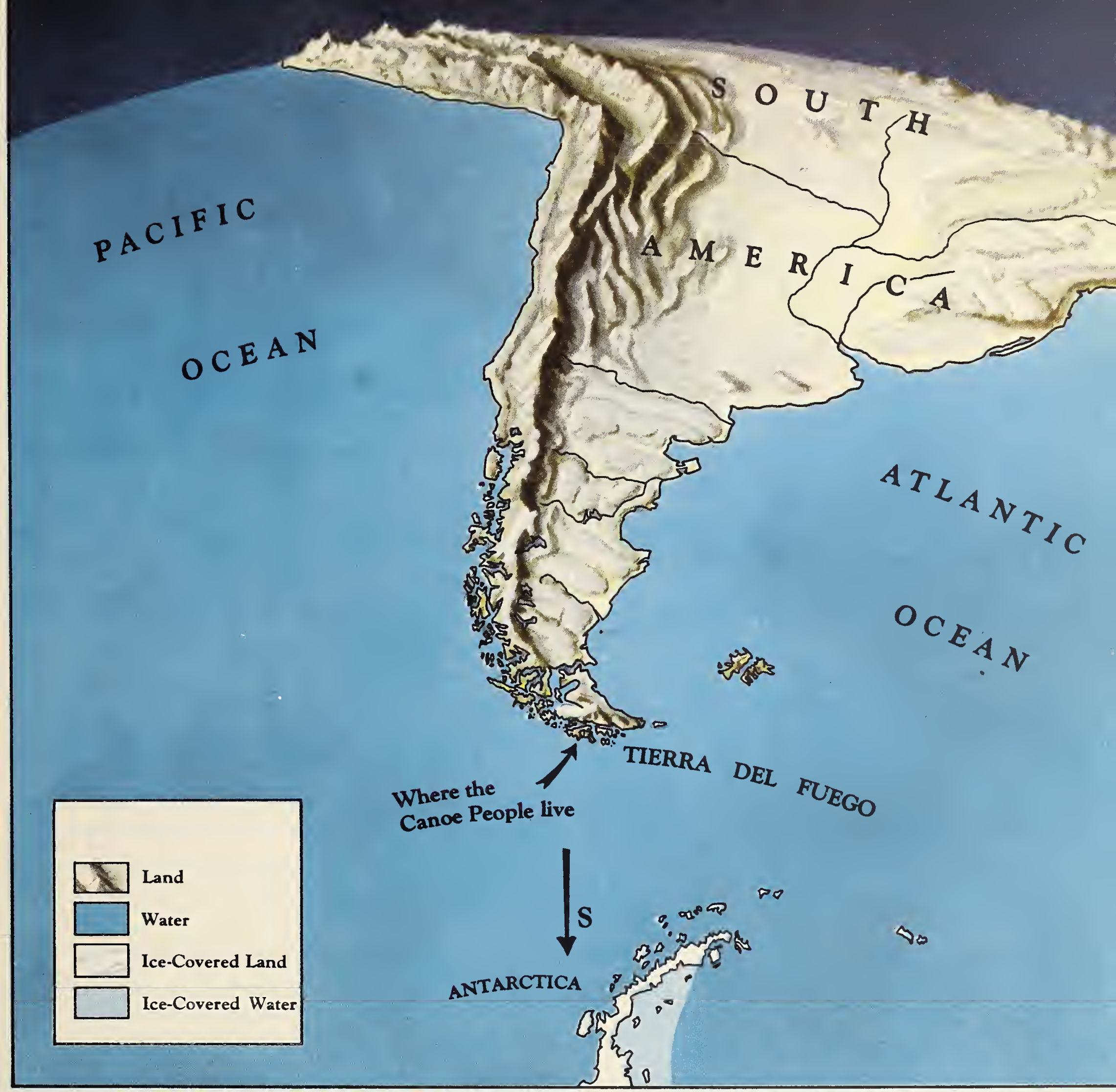
Where the Canoe People live. To learn just where the Canoe People live,



you can look at this globe. Find the south pole. It stands for the point farthest south on the earth. On this globe you can see the equator, the imaginary line exactly halfway between the poles.

North is always toward the north pole. Wherever you are on the earth, if you move toward the north pole, you are going in the direction called north. South is always toward the south pole. If you face toward the north pole, east is to the right, and west is to the left. If you face toward the south pole, east is to the left, and west is to the right.

Parts of two continents appear on this globe. One is Antarctica, the ice-covered continent where the south pole is located. The other continent is South America. The Canoe People live on the islands at the most southern part of the large continent of South America and on the far southern edges of the continent itself.



Tierra del Fuego is much larger than the other islands. Find this large island. Some of the islands are merely rocks which reach up out of the water.

The Canoe People live farther south than any other people in the world. You can see on the globe that two oceans meet near Tierra del Fuego. What are the names of these two oceans?

Globes and maps. The globe on page 16 shows an entire hemisphere, or half of the round earth. Notice the area that has been painted a milky color, lighter than the rest. On this page is a map which shows only the part of the globe in this light area. This map has been taken from the globe, but has been made much larger. It is so large that you can see the mountains and the shapes of the little islands near Tierra del Fuego.

This map does not show either the north pole or the south pole. How can you tell which direction on this map is south? Which direction is north? If you were standing at the tip of Tierra del Fuego and looking north, east would be to your right and west would be to your left. South would be behind you. On any map of any part of the earth, if you know one direction, you can find all the other directions.

You can see that from a globe we can copy a picture of any part of our earth. The earth is very, very large. The islands where the Canoe People live are only a very small part of it.

A SIMPLE WAY OF LIVING

The Canoe People spend most of their time searching for food. But they can find only a few things to eat — fish, shellfish, birds, birds' eggs, whale meat, and seal meat. The Indians live in simple shelters which they build in a few hours. They use materials which they happen to find near by. The houses in our country take weeks or even months to build. The building materials are brought from many places. The Canoe People move from place to place every few days. But they do not have large boats, automobiles, trains, or airplanes, as we do. They travel on foot or in the canoes that they have built themselves.

A primitive way of living. Because the Canoe People know how to do only a few things, their way of living has been called *primitive*. This means like the simple ways of people who lived long ago. The Canoe People live in a land where few white people would care to live. These Indians could not live there if they did not know how to make strong canoes and how to use them in fishing. They make nothing to sell to other people. So they have no money to buy anything. They get their food, clothing, and shelter from things on the earth or in the ocean about them.

There were never many Indians living in these islands at the tip of South America. Very, very few of the Canoe People are living today. Indians of other tribes who live on some of the islands are also becoming fewer and fewer.

Only these small heaps of shells remain to show where the Indians have camped.

Are You a Junior Geographer?

When you read about people in this book, try to find all the ways in which they are like you and the ways in which they are different. In which of these ways are you like the Canoe People?

a. The Canoe People live on islands.
b. They have to work for their food.
c. They live on fish and shellfish.
d. They make their own baskets.
e. They build their own shelters.
f. They are nomads.
g. They wear sealskins.
h. They live in a primitive way.

WORDS TO EXPLAIN

subsistence farming
hemisphere
north pole
south pole
shellfish
mountain
hill
island
beach
tide
beech
map
cliff
complex
whale
seal
sling
nomad

WORKING AND PLAYING WITH MAPS

1. Point out on the globe where the Canoe People live.

2. Show the north pole, the south pole, and the equator. Which of these three is closest to Tierra del Fuego?

3. Look carefully at the shape of the tip of South America. Now close your book and try to draw the shape of the part where the Canoe People live.

A WORD GAME

Be sure to find out the meaning of words when they are printed like this: *subsistence farmer.* In the column on the left are a number of such words. In the right-hand column are groups of words that tell what the first words mean. Match the two columns. Example: *Gales* are strong winds.

occupation	men who raise crops to sell
commercial farmers	people who know how to do only a few things
nomadic people	the work that a person does for a living
plains	strong winds
plateaus	the things people own
belongings	high, level-topped lands
gales	low, level lands
primitive people	people who do not stay long in one place

QUESTIONS TO TALK OVER

1. Would you like to live where the Canoe People do? Why?

2. Why have white people not settled in these little islands?

3. How do the Canoe People get their living?

4. Do all the families of the Canoe People get their living in the same way or in different ways?

5. What are some of the ways in which the people in our country make their living?

6. Why do the Canoe People not use big boats when they go out on the ocean?

7. Why do they not live in comfortable houses rather than in wigwams?

The Eskimos of North Greenland

AN ESKIMO AND HIS DOG TEAM

It is a very cold winter day in the far north. An Eskimo hunter starts off across the dry snow in a dog sled. He is wearing furry skins that cover his body almost entirely. Only his face shows.

Even though it is daytime when the hunter sets out, the sky is dark and the stars are shining. For in this land there is no sunlight from October to late February. There is only twilight in the middle of the day. In December there is not even twilight.

All around the Eskimo and his sled are white snow and ice. There are no trees, but where the snow is thin low plants can be seen. In places there are bare rocks. Sometimes the hunter sees an owl or a raven. The other birds have gone south for the winter.

Nine strong dogs draw the sled over the snow and ice. Each dog is hitched to the sled by a long leather strap. They spread out like a fan in front of the sled. The dogs run fast for a while. Then they slow down to four or five miles an hour, about as fast as a man walks.

This Eskimo and his dogs are going seal hunting. They are moving toward the sea, where the dogs will help their master hunt for seals. They will go on the ice right out over the water. In places the ice over the water is thin and unsafe for traveling. The Eskimo is careful not to drive his dogs on thin ice.

Hunting seals in winter. Far out on the ice the Eskimo stops his dogs. He takes off the strap that fastens one of the dogs to the sled. The hunter holds the strap like a leash. The eager dog walks ahead over the ice, tugging on the leash and sniffing all the while. The hunter follows, carrying his *harpoon*. You can see a harpoon in this picture. It looks like a spear with a strong line tied to the point.

Soon the dog stops and begins to scratch in the snow. The hunter knows that this is the breathing hole of a seal. Seals go down under the ice to catch fish and other sea animals, but they must come up every few minutes to breathe. Below the surface the hole is much wider, and the seal has space for its large body. The Eskimo could not have found the breathing hole himself, for it was covered with snow. The dog, however, can smell the place where a seal comes up to breathe.

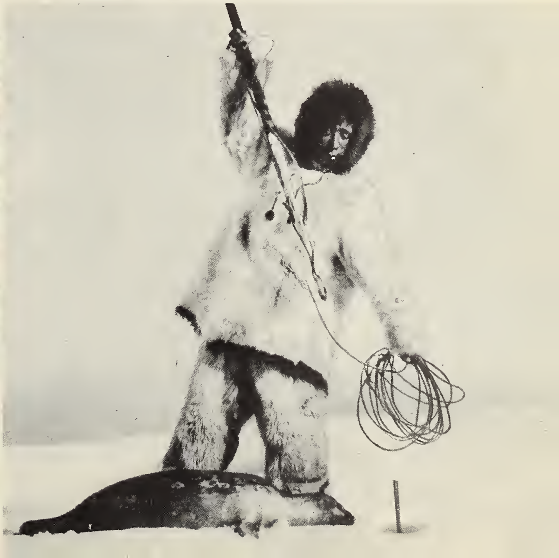
The Eskimo leads the dog away from the hole, and covers it again with snow. Then he pushes a long thin rod made of ivory through the snow into the hole. He stands watching the thin rod, with his harpoon ready. Quietly the Eskimo waits. Since a seal has more than one breathing hole, it may not come to this hole for hours. If the hunter makes a noise, he may scare a seal away as it comes near.

Catching a seal. After a while the hunter sees the ivory rod rising out of the snow. He quickly pushes his harpoon down next to the rod through the hole in the ice. Since the seal is not badly hurt, it tries to pull away, but the harpoon in its flesh holds it. The Eskimo grasps the harpoon line tight and makes the breathing hole bigger. When he pulls the seal out of the water, he sees that it is about the size of a large dog. But, of course, the seal does not have legs.

This is a hair seal. These Eskimos do not hunt the fur seal which has the soft fur used in sealskin coats. There are no fur seals in these waters. The hair seal has coarser fur.

The picture on the left shows the Eskimo's dogs waiting for their master. In the other picture you can see the Eskimo. He has caught one seal and is waiting for another.

AMERICAN MUSEUM OF NATURAL HISTORY AND EWING GALLOWAY



MONKMEYER

Sharpening the sled runners. See how parts of the sled are tied together with leather.

The hunter kills the seal and loads it on his sled. Then he takes his dogs to another place on the ice to look for more breathing holes. When the hunt is over, the dogs and their master start back to their winter home.

How the seal is used. The hunter's wife will skin the seal and cut it up. The family will use every bit of the skin, the fat, and the lean meat.

The thick layer of fat under the skin is called *blubber*. Eskimos eat some of this blubber, along with the lean meat of the seal. Sometimes they eat it raw and at other times they cook it. Their dogs eat blubber, too, along with the lean meat.

The Eskimos melt the oil out of some of the seal blubber and burn the oil in their lamps. They use these lamps for lighting and heating their houses and for cooking. The skin of the seal is used in making boots and clothing and in covering the tents in which the Eskimos sometimes live. They also use skins when they make a boat to go out on the water. From inside the seal they get a thin material like the skin of a sausage. They use this material to make windows in their houses. You can see that the seal is of great use to the Eskimos. They would not know how to get along without the seal.

The Eskimo's sled. This Eskimo's sled is made of wood. No trees grow in this land. But in the summer, when the sea is not frozen over, wood sometimes floats to North Greenland from other lands, where trees grow. Since Eskimos cannot always find wood, they sometimes make the frames of their sleds of bone or ivory. The runners are made of iron, which the Eskimos get from white men in exchange for furs. Eskimos often dip the runners into water. The water freezes into a layer of ice that will slide easily over the snow.

Taking care of the sled dogs. The Eskimos have many kinds of dogs, just as we do. But Eskimo dogs have to have fairly long hair and thick fur beneath the hair. Unless they have this thick fur, they will die from the cold. Their eyes are bright. These dogs have been with their master ever since they were puppies, and he has trained them to pull his sled and help him hunt food.

The Eskimo takes good care of his dogs. In the spring, ice may get between their toes. It rubs them and makes them bleed. Then the dog is not able to travel long distances. The hunter does not wait until he sees his dogs' feet leaving bloody tracks in the snow. He stops every few hours so that his dogs can rest and bite the ice from between their toes. Sometimes the ice where the hunter is traveling is rough, with sharp edges. Then, before he starts out, he ties dog shoes on his dogs' paws. These shoes are really small skin bags.

In winter the man usually feeds his dogs every other day. He gives each dog about two pounds of meat. His dogs need meat to keep them warm and strong enough to do the hard work of pulling a loaded sled. The dogs are often tired and hungry. However, if their master has no food for them, they are able to work without food for three or four days. Because of their thick fur, they are seldom cold.

In the summertime the dogs have little to do. Then they sleep lazily and do not eat much. But in winter they need plenty of food.

Hunting polar bears. Eskimos also hunt the polar bears that live in the far north. These large bears have heavy fur of a creamy white color almost as light as the snow. They live mostly on the floating ice. Often they float out to sea on blocks of ice. They can swim well, and they catch and eat seals. Usually a polar bear hunts alone, but in the spring the father and mother bears are seen together. These big white bears do not all sleep in the winter. Only the mother bears sleep all winter as other kinds of bears do.

The Eskimo uses his dogs to find the trail of a polar bear. When the dogs smell the bear's tracks, they start off after it very fast, keeping their noses to the ground. The Eskimo must hold tightly to the sled, as it races along, in order not to be thrown off and left behind.

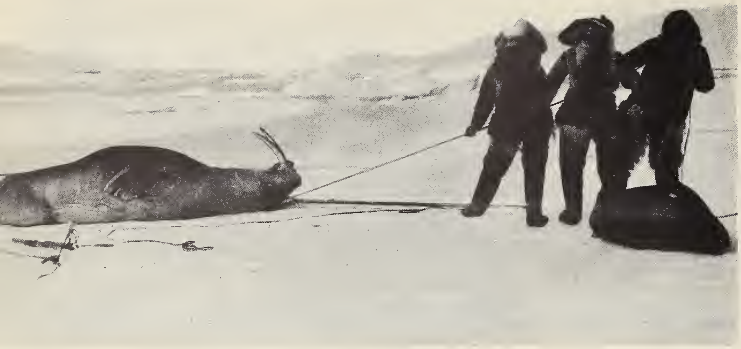
The dogs may follow the bear's tracks for two or three hours before they come in sight of the animal. Then they try to keep up with it. If a bear gets too far ahead of the hunter and the dogs, they will lose sight of it, and it may get away.

Dangerous hunting. Hunting polar bears is exciting but it may be dangerous. If an Eskimo drives over thin ice, it may break. Few Eskimos learn to swim, for the water is so cold that a swimmer would be helpless. If a hunter lets his dogs take him too far from home, he may run out of food and starve before they can bring him back. The ice may break away from the rest of the ice field and carry the hunter out to sea.

Before the Eskimos had rifles, the greatest danger was from the bear itself. Polar bears are large and very fierce. When a bear is surrounded by dogs, it will fight savagely. The Eskimos and the dogs must keep out of the big animal's reach. Eskimos used to kill polar bears with their spears, and some still do. But many

In the first picture a great polar bear has been surrounded by excited dogs. The second picture shows the dead bear loaded on the sled, ready to be taken back to camp.

AMERICAN MUSEUM OF NATURAL HISTORY



AMERICAN MUSEUM OF NATURAL HISTORY

Dragging a dead walrus out of the water onto the ice. The object that looks like a balloon is a sealskin float filled with air. The Eskimos tie the floats to the lines of their harpoons. Can you tell how these floats are used?

Eskimos use rifles, which they obtain from white men in exchange for furs.

After the bear has been killed, the men drag it onto a sled and take it home. The bear is about nine feet long, and it weighs as much as five or six men.

Eskimos eat the meat of the polar bears and use the skin, which is covered with heavy fur, for warm clothing. Since hunting the polar bear takes skill, an Eskimo boy must kill one before he is thought to be grown up. Every boy wants to kill one of these big, white bears and be called a man.

Harpooning the walrus. The Eskimos often see another animal which is even heavier than a polar bear. It is the fierce-looking *walrus*. This animal is clumsy when out of the water and moves very slowly. It has two long white teeth growing downward from its upper jaw, one on each side. These teeth are called tusks, and they look like the tusks of an elephant but are not so long. They are ivory like an elephant's tusks.

The walrus cannot live below the ice as the seal does. It is too large to breathe through holes in the ice. Therefore it must go into the open water. Since the water along the shore is frozen over in winter, the walrus must go out over the frozen edge. Often it travels far away from land. The hunter who wants to kill a walrus must also go far out on the ice.

This big animal lives on the food it can find on the bottom of the sea. It dives down into the water for crabs and shellfish. It digs up shellfish along the shore with its tusks. It has flippers instead of legs and can swim fast.

Sometimes the Eskimo hunter creeps up softly on a walrus asleep on the ice and harpoons it before it can get into the water. Now the Eskimo will have meat to eat, fat to boil down to oil, and ivory with which to make tools. He will make the strong skin into leather, which he will use in many ways. He may use the leather for boats or cut it into strips to tie parts of his sled together.

Since the summers in the far north are too short for crops or trees, the Eskimos have no farms. They have no vegetable gardens, grain fields, or orchards. But there are many land and sea animals that provide the people with fish and meat. The Eskimos eat these foods without salt.

WINTER HOMES

When we hear the word *igloo*, we usually think of a snowhouse. But the Eskimos call any shelter an igloo. The Eskimos of North Greenland use stone houses in winter and tents in summer. Both of these are igloos. The stone igloo is usually built near the shore. Then the men will not have far to go to the sea ice when they want to hunt. Since the igloo faces the sea, the Eskimo women can watch for the men returning from the hunt.

A stone igloo is often built on the slope of a hill. The back part of the house is partly underground. The front is the highest part. The walls are built of stones. The spaces between the stones are filled with smaller stones and earth. The top of the house is made of large flat stones covered with earth and grass. When fires are built inside the house the stone walls keep the heat inside, and thus help to keep the room warm.

Before you enter an igloo, you must crawl through a low tunnel built of stone. You then come to a hole in the stone wall. Here, too, you must crawl on your hands and knees.

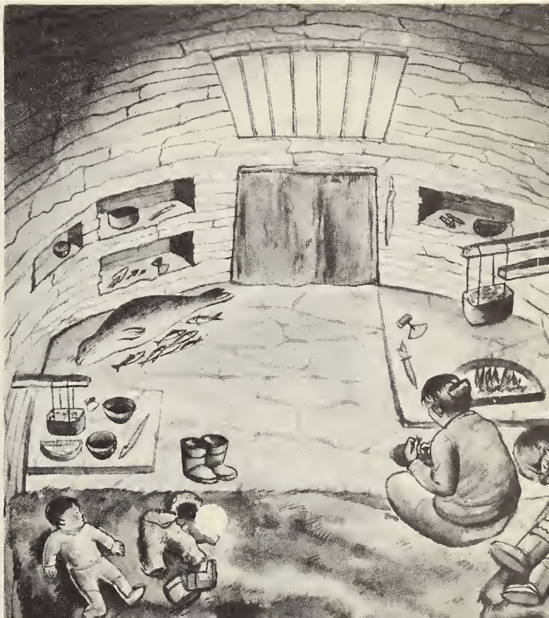
A big, warm room. Inside the house is a single room. It is warm and comfortable. Several oil-burning lamps placed low in the room keep the house cozy. An Eskimo lamp is a large shallow bowl hollowed out of stone. It is usually filled with seal oil, but often the Eskimos use oil from the fat of other animals. A wick made from dried moss soaks up the oil and burns it without smoking. The Eskimo women keep the bowls filled with oil. They pinch off the burnt part of the wick so that the lamp gives a steady flame. As the lamps burn, the air near the floor becomes warm and rises to the upper part of the room. A small hole in the roof acts as a chimney. The Eskimos can plug the hole with a piece of skin to keep the warm air from escaping.

A bed of skins. At the back of the room is a low platform made of stones laid on the floor. The platform looks like a half-moon, with the round side against the wall and the straight side at the center of the room. The Eskimos cover this platform with furs and skins and use it for a bed. They sleep with their feet toward the back of the room and their heads toward the center. The children sleep on the sides of the platform, which are shorter than the middle.

Simple furnishings. In the front part of the house there are many shelves built into the wall. Here the Eskimos put tools, animal skins, harpoons, and other belongings. Underneath some of the shelves the Eskimo women put the meat and blubber which they will use that day.

To cook meat the women boil it in a pot over the oil lamps. They have no way of roasting meat. After the meat is cooked, it is kept warm over the lamp. An Eskimo eats at any time when he gets hungry. There are no regular mealtimes such as we have.

This drawing shows what you might see if you stood at the rear of the bed platform in a stone igloo. The child has taken off his outer suit. His mother is sewing. Notice how the lamps are made.



The beds and shelves take up much of the room. There is only a small amount of open space left in the middle of the house. Here grown people can stand up straight, but they cannot do so around the edges of the room.

Eskimo windows. There is a window in the front wall just above the door. It was made by sewing together strips of thin material like skin, which came from the insides of the seal. It does not become frosted as glass windows do, and it will not break easily. You cannot see through this window, but light can shine through it. The window may have in it a little peephole that you can look through. Sometimes Eskimos use a thin sheet of clear ice for a window. The air outside the house is cold enough to keep the ice from melting.

If you were outside the house, you might see a mist coming out of the hole in the roof and the peephole in the window. The air coming out of the warm room acts just like your breath which you can see when you are out-of-doors on a cold day. When warm air is cooled, it gives off some of its moisture in the form of very small drops. These drops are so tiny that you would not be able to see one of them alone. But all together they make the air cloudy. If you saw much mist coming out fast, you would know that it was warm inside the igloo.

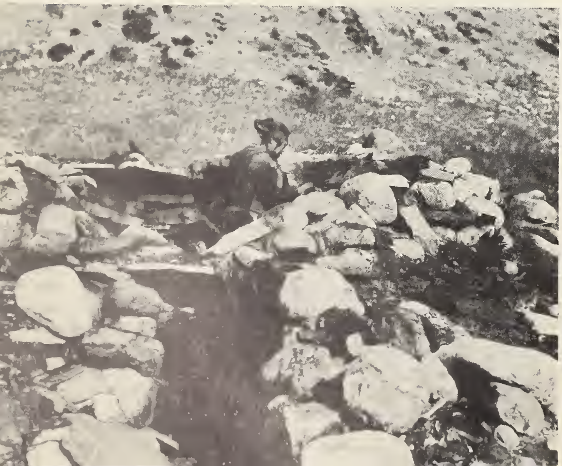
Taking care of the house. These stone houses are very old. The Eskimo families come back to them every winter. When the Eskimos leave in the spring, they lift off the stones from the roof to air out the house. Before the winter storms begin, the women must make their homes ready to live in again.

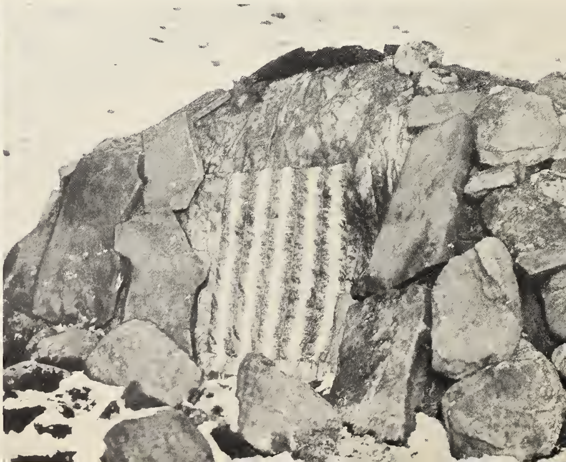
First the women clean out the inside. If there are holes in the walls, the women put earth and small stones in them to shut out the cold. They lay the roof of stones and cover it with grass and earth. If hunting is not good, the men stay at home to help the women. After the first heavy snow falls, the families move in. They stay all through the long, dark winter.

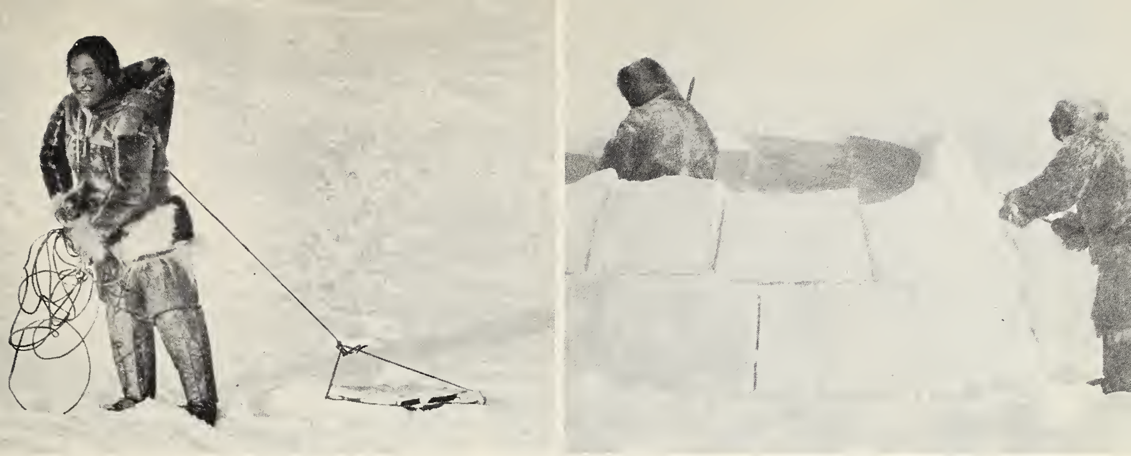
A hunter's snowhouse. Sometimes the Eskimo man goes on a hunting trip which lasts two or three days or even longer. He travels with his dog team far out over the ice. When he must rest, he is too far away to go home to his stone house. So he builds a house of snow blocks to shelter him for a few days. This also is an igloo.

Getting the igloo ready for winter. The woman is repairing the walls. The right-hand picture shows how the upper part of the finished igloo will look. Notice the window made of thin skin-like material from the inside of the seal. The door and tunnel are not shown.

AMERICAN MUSEUM OF NATURAL HISTORY







AMERICAN MUSEUM OF NATURAL HISTORY

On the left a woman is dragging a flat stone for the roof of her house. On the right two hunters are building a snowhouse. One is laying blocks, and the other is filling cracks.

The hunter looks for snow which is just hard enough to use for building a house. If the snow is too soft, the house will fall in. With his bone knife he cuts snow into blocks about three feet long and six inches thick. Then he puts the blocks on the ice in a circle. He shapes the edges so that they will fit together. He places two tall blocks so as to leave space for the door.

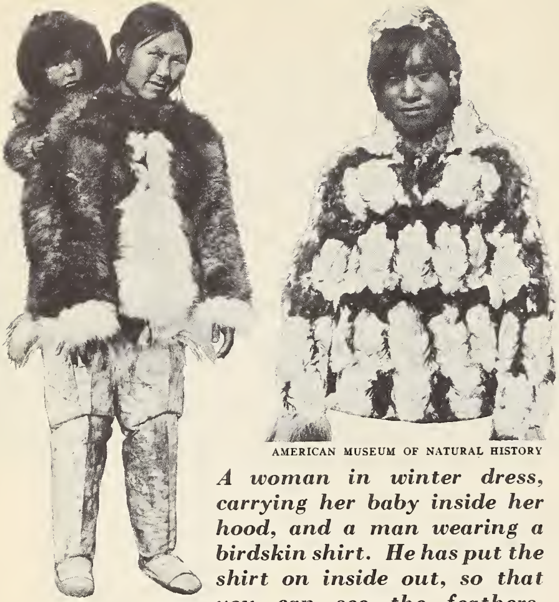
Then he puts another layer of blocks on top of the first layer, sloping them a little toward the inside. The next layer is tipped inward even more. He puts a long block over the top of the two tall blocks where the door is to be. When the top is reached, only one block is needed to finish the house. The hunter puts snow in the cracks between the blocks. A big block of snow is used to close the door.

Often several hunters work together. One hunter cuts the blocks. Another carries them to the builder. The third hunter builds the house.

Sleeping in the snowhouse. When the men are tired from hunting, they sleep in their new house. Each hunter takes off his clothes and gets into the sleeping bag which he brought with him. He has placed his bag on top of a thick sealskin to protect him from the snow. His bag is made of several sealskins sewed together with the hair on the inside. A long flap is at the open end. The Eskimo slips down into his bag and draws the flap in over him. He leaves only a small opening through which to breathe. Though the hunters are far away from their homes and families, they are warm and comfortable in the snowhouse.

The hunters may stay in this snowhouse for several weeks if the hunting is good. They burn oil in lamps to keep themselves warm. But they do not let the room get as warm as they would in a stone hut, for then the snow blocks would melt. The men may even cover the inside walls with skins to keep the heat of the lamp from reaching the blocks.

During these winter days, as you remember, the hunters do not see the sun. It never comes above the *horizon*, the line where the earth and sky seem to meet. The days are dark and very cold. But often, when the weather is clear, the moon and stars light up the snow-covered, treeless land and the frozen edge of the ocean.



AMERICAN MUSEUM OF NATURAL HISTORY

A woman in winter dress, carrying her baby inside her hood, and a man wearing a birdskin shirt. He has put the shirt on inside out, so that you can see the feathers.

HOW THE ESKIMOS DRESS

In wintertime the Eskimo wears warm clothing made from skins and furs. He wears great mittens made of sealskin and fur. To keep his feet from freezing, he wears skin boots that reach to his knees. Inside his boots he has stockings made of thin furry skin from a young reindeer. An Eskimo often puts pads of dried grass between the sole of his shoe and the bottom of his stocking. This grass helps to keep his feet dry and warm. After a day's travel the grass may become wet and freeze together. But the fur stockings stay warm and dry. In very cold weather the Eskimo hunter also wears overshoes made of skin. He puts them on over his boots.

The hunter's trousers are made of bearskin. They come down a little below the tops of his boots. He wears a foxskin jacket in cold weather. The jacket is soft and comfortable. It has bands of fur around the neck to keep out wind and snow and a hood fastened at the back of the neck. The men and women dress much alike, though some of the men's garments are made of stronger skins.

The man's underwear may be made of the skins of birds with the soft feathers left on. This is the very softest material which the Eskimos can find. His undershirt is made of the soft feather breasts sewed together. He wears the feather side next to his skin.

Eskimos are about medium height, but in winter when they put on all these clothes, they look short and fat. In summer the Eskimos do not have to wear so many clothes. One fur suit is usually enough.

Making the clothes. The Eskimo woman makes all the clothes for her family. She used to sew with a bone or copper needle that made fine holes. Now most Eskimos buy steel needles from the white traders in exchange for skins. The woman makes her thread from strips of skin or the material like skin from the inside of the seal. When the skin thread gets wet, it swells and fills the needle holes, so that the seams are watertight. You can see that the Eskimos make good use of the animals that live in this land.

When a hunter comes into the house, he beats out the snow or frost that is in the fur of his clothing. For this purpose he uses a flat piece of bone like a ruler which is kept hanging near the doorway. This tool, which is called a snow-beater, is sometimes made of wood.

SUMMER IN NORTH GREENLAND

About the middle of January the Eskimos notice that the southern sky is much lighter in the middle of the day. In February, the sun, large and red, can be seen for a few moments above the horizon to the south. The next day it seems to

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A sun bath in the Arctic summer. These Eskimo children are warm enough in the sunshine without clothes. The puppies seem to like the sunshine too. The skin is from a polar bear.

move along the horizon a little longer. As the days pass, the sun is higher in the sky each noon. But the sun never gets as high overhead as it does where you live.

By late March the sun stays in the sky for twelve hours. By the end of April there is sunlight for the entire twenty-four hours. The long summer days have come when there is no darkness at all.

Most of the snow is gone in summer. The ice along the shore has melted or floated away. The sea is no longer frozen over. The grass begins to grow. Birds fly back from their winter homes in the south.

The level ground becomes soft and wet, for the topsoil is no longer frozen. If a traveler is not careful where he steps, he will sink to his knees in the mud.

Moving to the summer camp. In the summer the Eskimo families move from their stone igloos. They tie their belongings in packs and carry them on their backs. The fathers carry big packs, the mothers smaller packs, and each of the children a little pack. Even the dogs have packs fastened to them, but at first the dogs try to shake off their loads.

The families and the dogs start to their summer camping place. The ground is full of water from the melting snows. The Eskimos must travel around many pools and ponds.

Putting up the tent. The men search for a level spot near their hunting grounds. Then each man sets up a tent for his family. First he sets up poles of wood which he gathered along the shore. Over these poles he puts thirty or forty sealskins that have been carefully scraped to remove all the hair. They are thin enough to let some light through. Many of the skins are then sewed together.

The tent is straight up and down in front and is a little higher than the man himself. It slopes toward the back and the sides. Members of the family gather

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A summer tent. Notice the clumps of grass.

AMERICAN MUSEUM OF NATURAL HISTORY

A hunter goes seal hunting in his kayak.

rocks and pile them on the edges of the skins to hold the tent down.

Sometimes frost and light snows come even in summer. Then the Eskimos put another layer of skins over their tents.

Inside the tent the man builds a low platform of stones on which all of the family sleep. It is much like the platform they sleep on in the stone house. When the Eskimos go inside their house, they fasten together the flaps over the doorway.

Some families like to live close to other families. Their tents then form a small village. Other Eskimo families like to be alone.

Eskimo boats. In summer the Eskimo takes his boat from the place where he kept it during the winter. He looks it over and gets it ready to go out on the water to hunt animals.

This strong boat is made of sealskin stretched tightly over a frame of wood. Even the top of the boat is covered, except for a hole just large enough for a man's body. This kind of boat, which is so light that a man can carry it easily, is called a *kayak*.

The hunter climbs into the boat and sits in the bottom. The edges of the hole fit close up around his waist so that only his head and upper body can be seen. He ties the lower edge of his jacket around the hole. He also fastens his jacket tightly around his wrists and neck. He is then fast to the kayak. A wave may wash over his boat, but no water can come in. Even if he turns over in the water, he will stay in the kayak. With a stroke of his paddle he will bring the boat out of the water right side up.

The Eskimo's paddle is longer than he is and is flat on both ends. To move the boat he dips one end of the paddle on one side of the kayak and then the other end on the other side.

Hunting in the kayak. Since his kayak is small, the hunter does not carry a heavy load. He takes only the things he needs for seal hunting. He has a harpoon to catch seals, a club to kill the seals, and a line to tie to them. In the spring and summer seals come up out of the water to lie on top of the ice and on the shore. The hunter can then creep up on the seals and kill them.

Sometimes the Eskimo goes out in his kayak to hunt walruses. He harpoons them as they swim in open water. Such hunting, however, is dangerous. If one walrus is wounded, the other walruses in the herd may attack the hunter.

You might think that the Eskimos would catch many kinds of fish when they go out in their kayaks. But they do not fish in the ocean. They catch only one kind of fish from the kayak. It is the salmon trout, a fresh-water fish that looks like the salmon. The Eskimos spear these fish where the streams flow into the sea.

The tundras. In some polar lands the topsoil thaws in summer. Since the water cannot sink into the frozen ground underneath, the topsoil is wet. Plants begin to grow. Soon the land is covered with moss, grass, and many kinds of low green plants. On the warmest parts there are small bushes and perhaps a few trees, but the trees rise only a few feet from the ground. The summer is too short for forests to grow. This polar land where there are some green plants but no forests is called *tundra*.

Tundras are found in almost all the lands bordering the Arctic Ocean. Some parts of the tundra are warmer than others and therefore have more plant life. The warmer places are usually sheltered from the sea wind. In many of these warm places the ground slopes gently toward the south, so that in summer the area receives strong sunlight.

On other more open parts of the tundra, only grass and very low bushes grow. They grow close to the ground because even in summer the weather is often cold, and strong winds blow. The roots cannot go deep into the ground to get food because the ground below is always frozen.

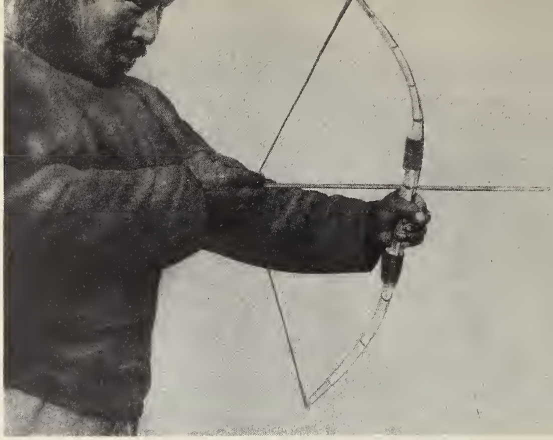
Polar deserts. There are other places in the polar lands where there is much bare rock and sandy soil. Here only a few tough plants and small bunches of grass grow, with much bare ground between them. These places are *polar deserts*. You have heard of lands that are deserts because they are dry. These places are deserts because of the cold.

North Greenland. Much of the coast is bare. Rocky cliffs rise above the ice-covered sea. Even the toughest plants can grow in only a few sheltered places. This is a polar desert.

EWING GALLOWAY

AMERICAN MUSEUM OF NATURAL HISTORY

Musk oxen. The one facing the camera looks very fierce. See its long, shaggy hair.



AMERICAN MUSEUM OF NATURAL HISTORY

An Eskimo with bow and arrow. Notice that the bow is made from pieces of horn.

HUNTING ON LAND

Musk oxen. At one time many musk oxen ran over the Arctic tundras. But now there are only a few of these animals left because so many have been killed with guns which white men took to the land of the Eskimos. The *musk ox* has a thick, shaggy brown coat and small horns. A herd of these animals looks somewhat like a herd of small cattle. A musk ox is not a very shy animal, and since it does not run away, it is easy to kill.

The musk ox never goes out on the sea ice. It always stays on land grazing on grass and moss. In the winter it paws through the snow to find bits of frozen moss.

When musk oxen know that a hunter is near, the cows and calves move to the center of the herd. The bulls face the danger. But even so it is easy to kill the animals. The Eskimo uses the meat of the musk ox for food. He uses the shaggy coat as a covering for a sled or the sleeping platform in his igloo. He makes tools out of the horns.

Wild reindeer. *Caribou* also graze on the tundra. They feed on the grass and the shoots and leaves of the low bushes. A caribou is a kind of wild reindeer. It has flat spreading antlers that look like the branches of a tree. The hoofs of the caribou are wider than a cow's hoof.

Caribou graze in large herds. Sometimes thousands of caribou move along in one herd. During the summer they travel many miles over the tundra.

The Eskimo knows which way the herds usually move and about where they will be at any time. He hunts caribou in the early fall when they are fat and their skins are in good condition for making leather. The hunter used to hide among rocks and shoot a caribou with his bow and arrow while the animals were grazing. His bow was made of three pieces of horn fitted together so that they could be bent easily. His arrows had tips of stone. But today many Eskimos use rifles instead of bows and arrows.

The meat of the caribou is used for food, and its antlers are made into tools. From the skins the Eskimo women make clothing, covers, and warm sleeping bags for the hunters.

Birds. After the long cold winter the Eskimos want other food besides seal meat. When summer comes, they eat birds. While the men are busy hunting seals, walruses, musk oxen, or caribou, the women hunt the black and white sea birds of the northern waters. Often the old men and the children help.

These birds are not much larger than robins. They build their nests among the rocks high in the cliffs. The Eskimo woman climbs these rocks, carrying a pole about ten feet long. At one end of the pole is a net, fastened to a round frame.

The woman hides among the rocks. When she sees a flock of birds flying by, she pushes her net out in front of them. She is very quick, even quicker than the birds. She may catch in her net two or three of these small birds at a time.

If the woman finds any bird's eggs, she keeps them for her children. They enjoy eating bird's eggs just as you enjoy eating candy.

Late in the summer the Eskimo woman catches birds for winter and leaves heaps of them under rocks. In this cold land the birds are soon frozen. When it is hard to get food, the Eskimos dig away the rocks. They find the birds frozen together and have to break them apart. The Eskimos eat the whole bird just as it is, bones and all. Several hundred birds last a family of three or four only a day or two.

Storing food for winter. In the summer when it is easy to get food, the Eskimo prepares for the long winter ahead. He knows that it will be hard to find food in the winter. So he stores away as much meat as he can.

Sometimes he puts it on a high pole where dogs and wild animals cannot reach it. Sometimes he buries it in deep holes or under rocks. Food keeps well in the Arctic lands because the weather is so cold. The meat which is stored freezes in winter. One of the best ways to keep food from spoiling is to freeze it.

In the left-hand picture an Eskimo woman is ready to climb the cliffs and catch birds in her long-handled net. The right-hand picture shows her catching a bird in the net.

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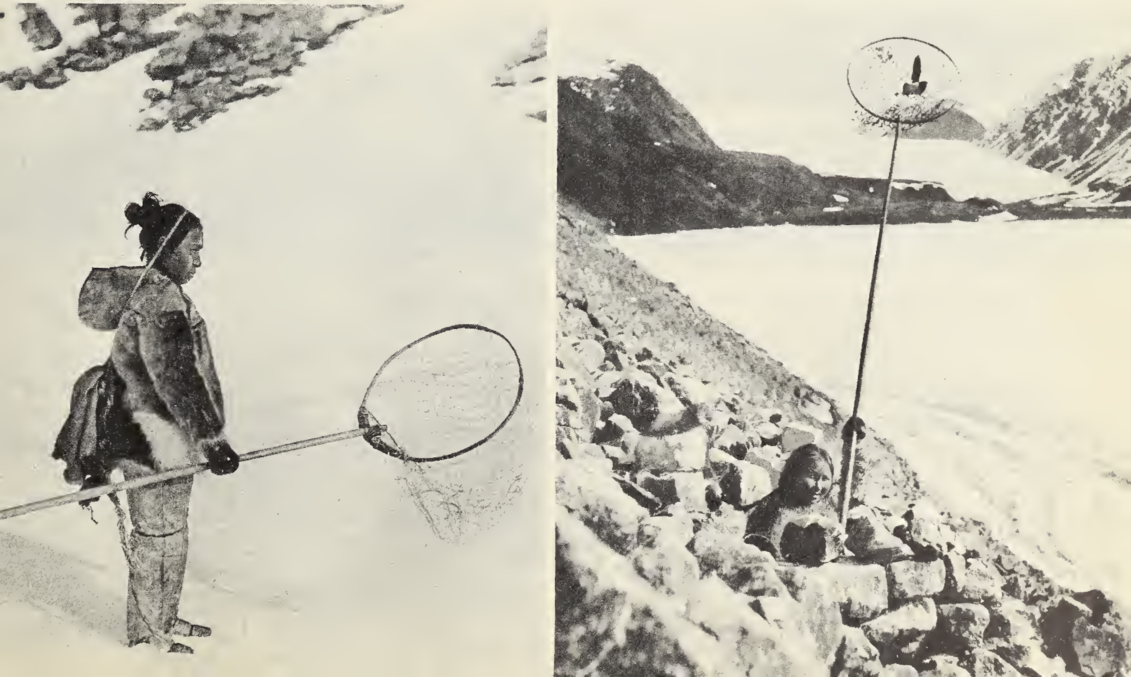


THE SEASONS IN NORTH GREENLAND

In North Greenland, where these Eskimos live, there is cold weather the year around. You can nearly always see snow and ice on part of the land. There are long winters with no sunlight. In the summer there is no darkness.

Spring begins when the sun first appears in the sky after the long winter night. During the two spring months, from late February to late April, the days are getting longer and longer and the nights shorter and shorter.

Summer comes near the end of April and lasts four months. There is sunlight all the time, for the sun never sets. It can be seen all day and during the hours which in our part of the world would be night. Yet it never rises high in the sky.

The ice and snow do not melt at once when summer comes. The winds are cold, and even at noon there is usually freezing weather. Not until the middle of June does the snow melt and the ice break up. Even then the ground does not thaw very far below the surface. For this reason water from the melting snow cannot sink far into the ground. The soil on top becomes very wet. It is hard to travel through the mud.

Then come the two months of autumn. Autumn begins late in August when the sun sets for the first time after the long summer. It ends late in October when the sun stops rising above the horizon. Autumn is just the opposite of spring, for it is the season when days become shorter and shorter and nights longer and longer. During the autumn the ground freezes again. The streams freeze solid. The sun, sinking lower and lower in the sky, gives less and less heat. Each day the sun at noon is seen closer to the horizon. Then one day it sinks below the horizon and does not rise again until spring.

Winter in North Greenland is four months long, just as the summer is. After late October there is freezing weather all the time. For a time the light of the sun still shines in the sky at noon until the sun has gone far below the horizon. The sky looks like the twilight sky of our country. At night there is only dusk. It is not completely dark except in stormy times. Light from the moon and stars falls on the snow and ice fields and makes them look bright. The eyes of the Eskimos and animals and birds that live there see well in the dim light.

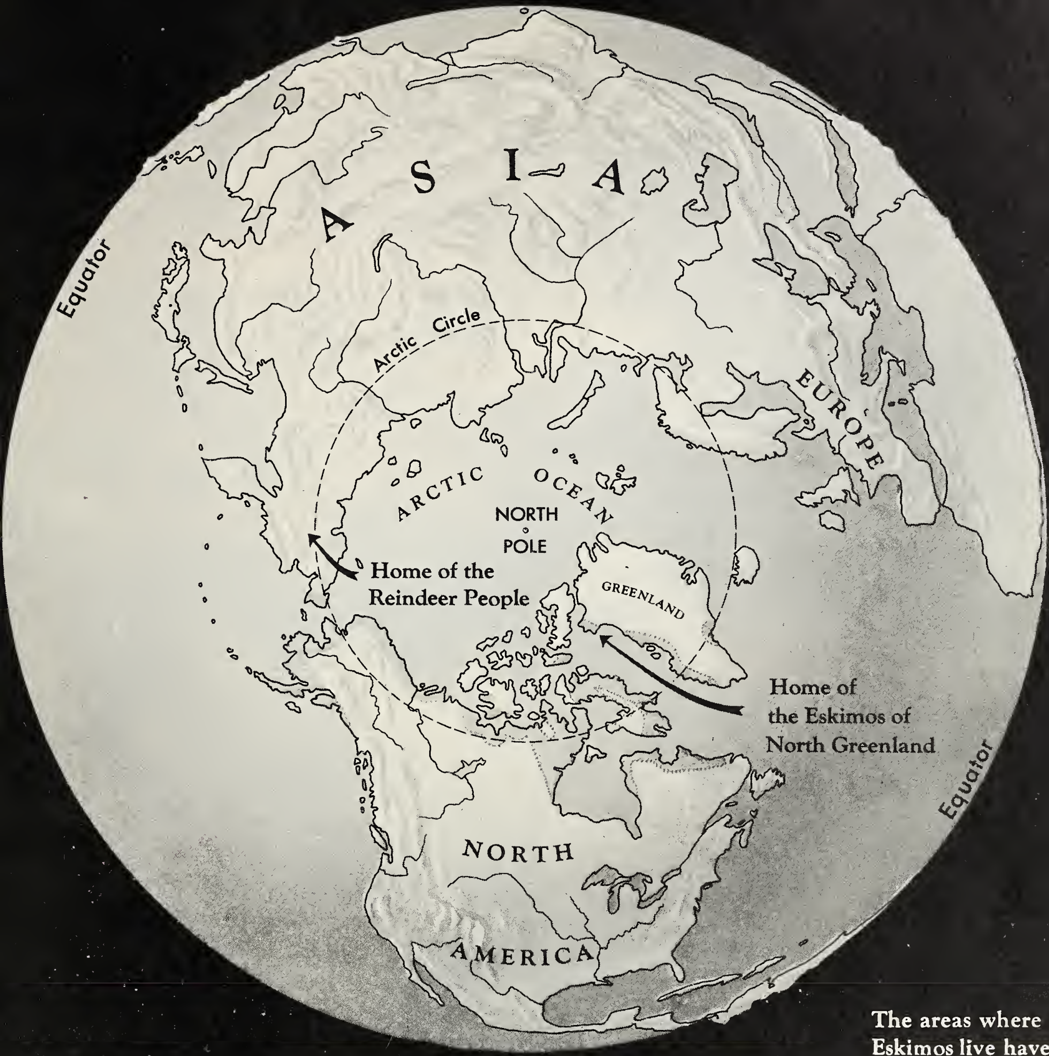
WHERE THE ESKIMOS LIVE

Find the north pole on this globe. Notice that the pole is in the middle of the Arctic Ocean. This ocean is usually covered with great masses of floating ice, even in summer. Now find the large island named Greenland that reaches northward into the Arctic Ocean. Except for those very large islands that we call continents, Greenland is the largest island in the world.

The Eskimos you have been reading about live in the northwestern part of Greenland. They live farther north than any other people in the western hemisphere.

Winter in Greenland brings cold snowstorms, in which strong winds blow. But the storms do not leave a great deal of snow on the ground. They are really windstorms. And although it is cold, it is no colder than on a winter day in the northern part of the United States.

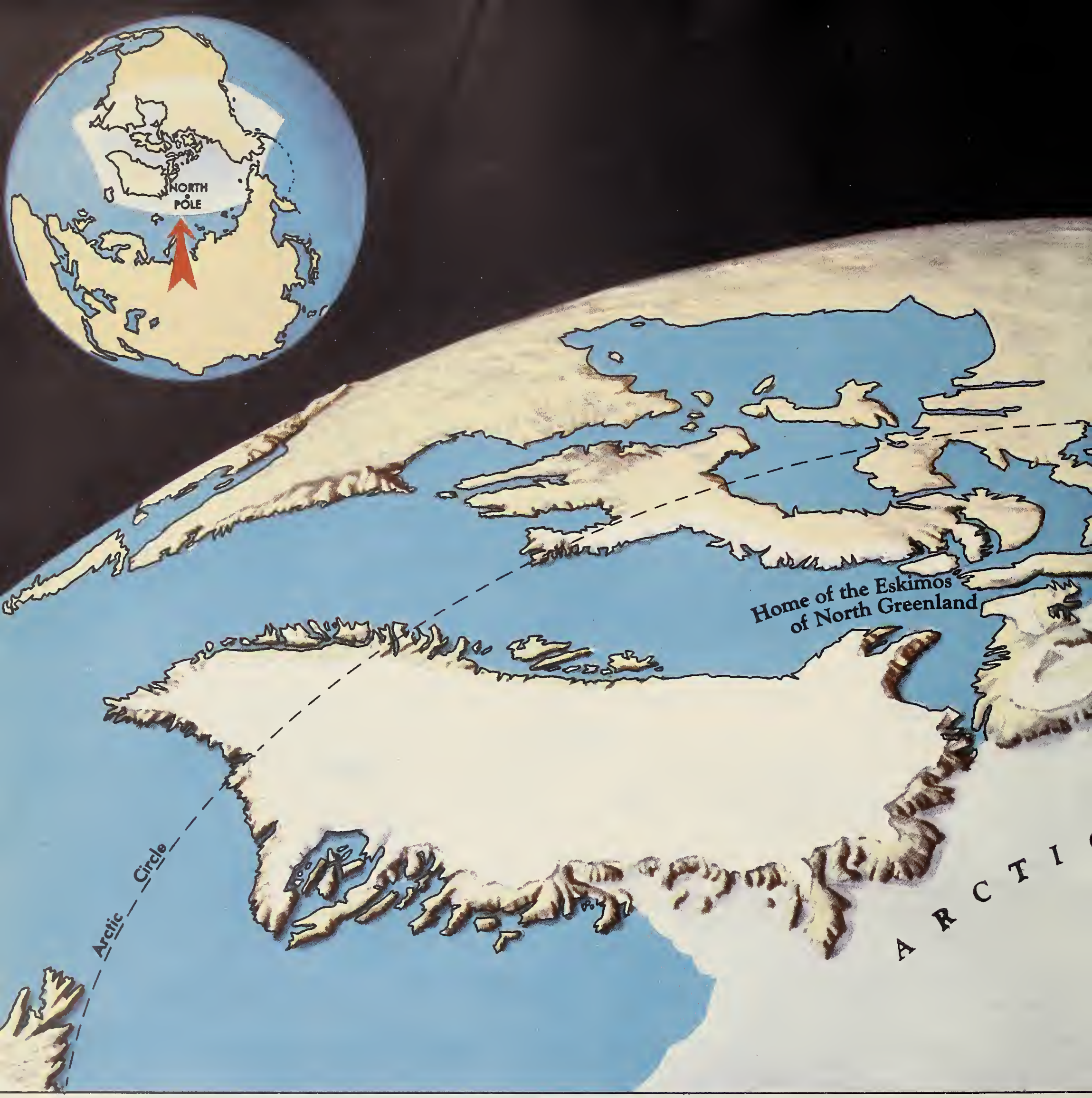
In summer there are rains, but the land is not a rainy land. The weather is too cold. The cool air does not take up much



The areas where the Eskimos live have been darkened on this map

moisture from the water. Also, the cold air does not rise as warm air does. And since it does not rise, it is not cooled enough to drop the little moisture it has.

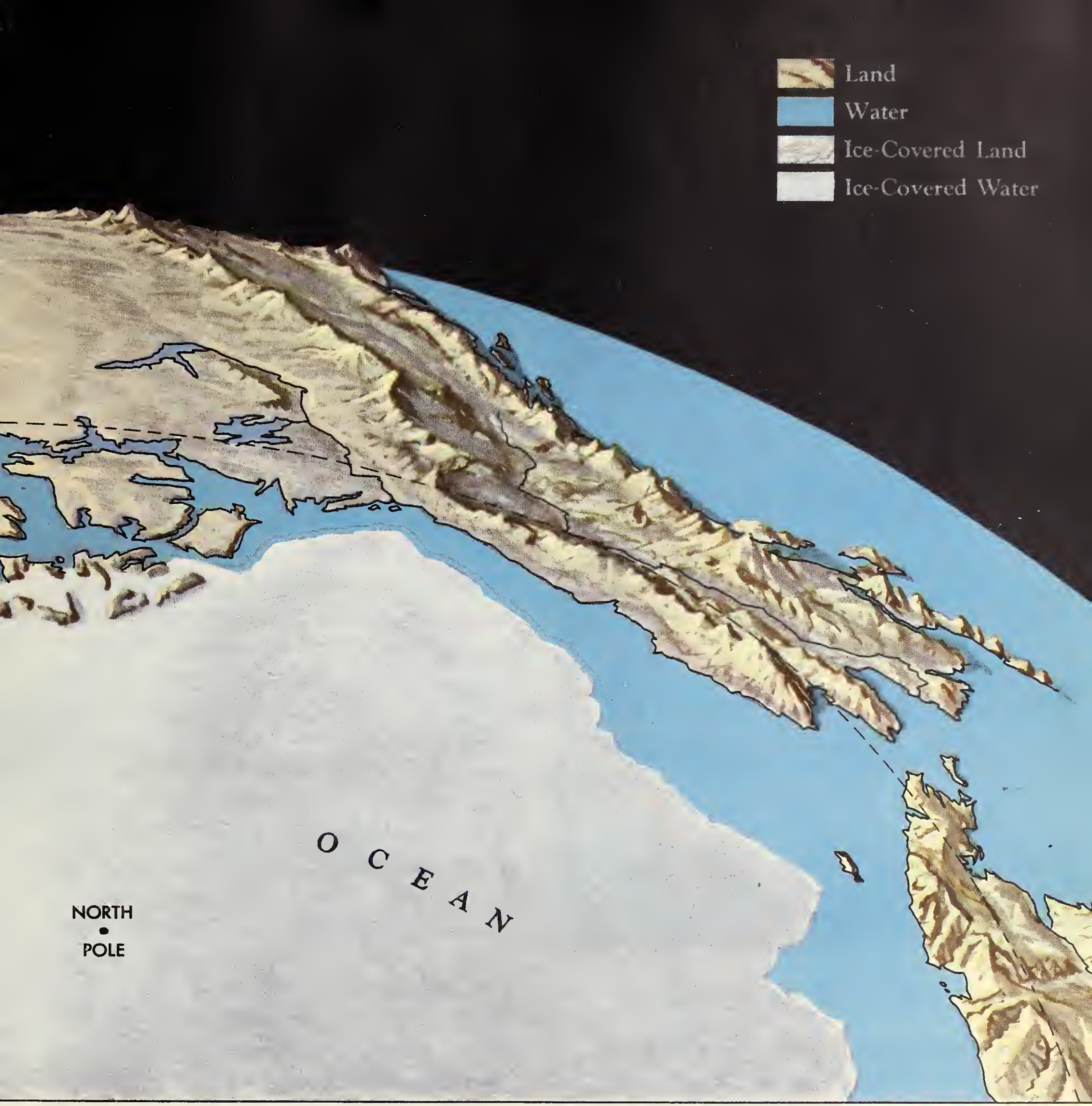
Eskimos of North America. More Eskimos live along the west coast of Greenland than anywhere else. But Eskimos also live on a broad strip of coast land along the northern edge of North America. This strip lies in two countries, Canada and Alaska. The globe on this page shows you one other region where Eskimos are found. Where is this region? On what continent do the Reindeer People live? The next chapter of this book tells about these people.



Here is a much larger map of Eskimo land. This is what the earth would look like if you could see it from a rocket ship hundreds of miles above the north pole.

Look at the small globe in the upper left-hand corner to see the area shown on this map. The red arrow points to this area, and it is colored lighter than the rest of the globe.

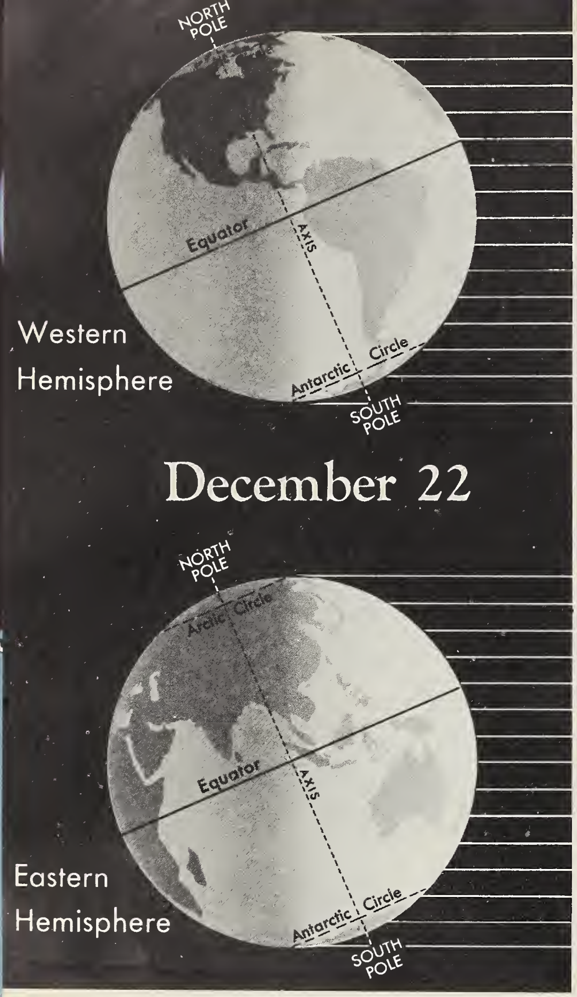
This map shows you the land and water and ice in the far north. On the land you can see great plains and also high mountain ranges stretching over the curved horizon. Find Greenland on this map. In what color is most of Greenland shown? If you will look at the little blocks of color in the upper right-hand corner, you can tell what this color means. Together these little blocks are called the *map key*. Most of Greenland is covered with a



layer of solid ice hundreds of feet thick. Notice that other lands are also covered with ice. This ice never melts, even in the few weeks of warmer weather in the middle of summer.

Find the Arctic Ocean on this map. Much of this ocean is covered with a layer of floating ice the year round. This ice keeps boats from moving on the water. You cannot go by boat to the north pole. What color stands for the floating ice? Farther to the south floating ice forms along the coasts in winter, and melts away in summer. Boats can come to these lands, but only in summer.

Now turn to the map on page 35 and notice the areas where the Eskimos live. Can you find these areas on this map? Try to find also the place where the Reindeer People live.



SUNLIGHT IN THE POLAR LANDS

The Arctic Circle. Look at the globe on page 35 and find a circle that you have not been told about. The dotted line around the north pole is an imaginary circle named the *Arctic Circle*. On December 22 the sun does not rise north of this circle. On June 21 the sun shines all day and all night north of this circle. We might say that the Arctic Circle is the boundary of sunlight in the north.

See the two small globes at the top of this page. One shows the western hemisphere on December 22. Half the earth is in shadow and the other half is in sunlight. The sun is just rising in the eastern part of our country. The white lines stand for the rays of the sun reaching the earth. The other globe shows the eastern hemisphere twelve hours, or half a day, later. The earth has *rotated*, or turned, halfway around on its axis. The sun is now rising in the central part of Asia. Notice that the earth is tilted and that on December 22 the north pole is turned away from the sun.

Find the Arctic Circle on the first globe. Notice that the sunlight does not reach father north than the Arctic Circle. Now look at the second globe. The earth has rotated halfway around on its axis. But there is still darkness within the Arctic Circle. As the earth rotates, the boundary between light and shadow moves right around the Arctic Circle.

The Antarctic Circle. Around the south pole is the *Antarctic Circle*. Here, on December 22, the darkness does not reach south of the Antarctic Circle. As the earth rotates, the edge of the shadow moves right around the Antarctic Circle. We might say that the Antarctic Circle is the boundary of sunlight in the south.

Now look at the globes in the picture at the top of page 39. The earth has moved exactly halfway around the sun. Now it is on the opposite side of the sun from where it was on December 22. It is now June 21, just six months later. Notice that the earth is tilted just as it was before. But on June 21 the north pole is toward the sun. See the rays of the sun shining on the part of the earth north of the Arctic Circle. Is the Arctic Ocean having winter or summer?

Seasons. Near the poles, in the Arctic Ocean and on the Antarctic Continent, the winter lasts for months at a time. At the poles there are about six months of sunlight, then about six weeks of evening twilight. Then come about three months of night, then about six weeks of morning twilight. But when it is summer at one pole, it is winter at the other.

The winter darkness and cold in the far north and far south make it hard to travel in these regions. Only a few explorers have ever visited either pole.

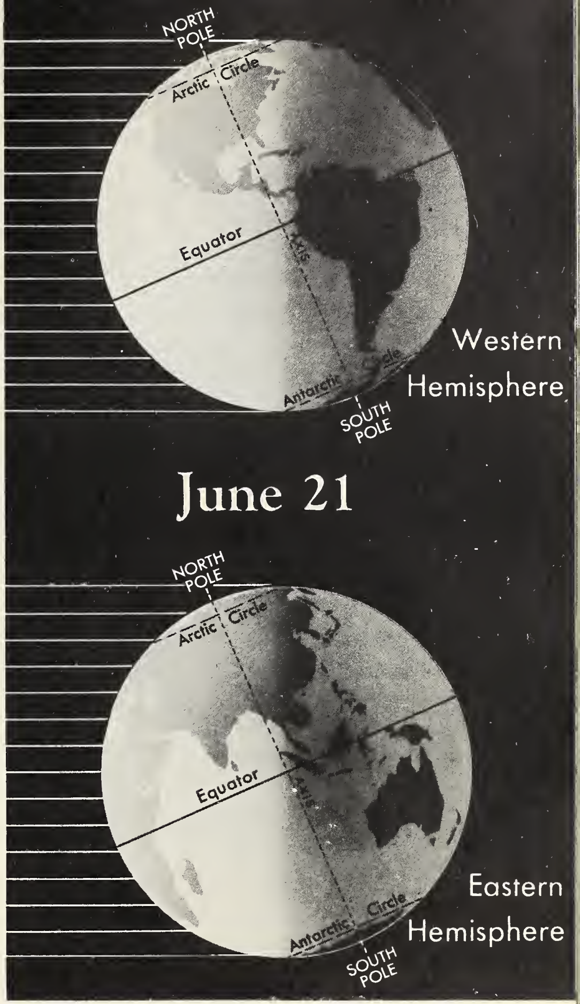
GETTING A LIVING IN THE FAR NORTH

Greenland is not a land where people find it easy to live. Except along the coast it is covered by thick ice. Few white men want to live in Greenland.

Nomadic hunters. The Eskimos live near the ocean in order to hunt the seal. They live almost entirely on meat. Sometimes they cook it and sometimes they eat it raw or frozen. They must hunt all the time to get enough to eat. Sometimes families have to travel far to find good hunting. In winter they sometimes travel for weeks to distant places where there are many seals.

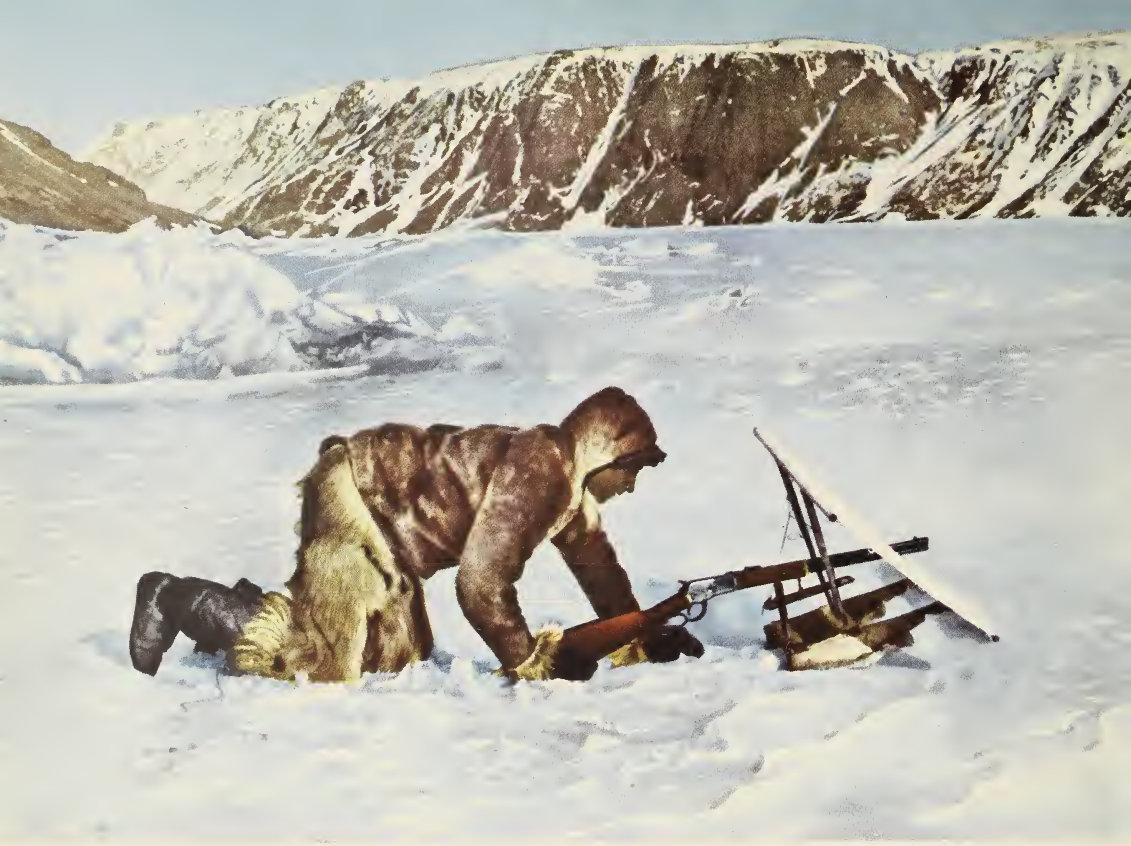
These people do not live in one place all the time. They must follow the animals which they hunt. For this reason they are nomads as are the Canoe People. But year after year the Eskimos go back to the same stone houses in winter. Therefore, they are not entirely nomadic.

Skillful people. You can see that the Eskimos know how to live in cold Arctic lands. They have learned how to build warm houses from the materials which are found there. They have learned how to hunt the animals that live on the land. They have learned how to use dogs in hunting and moving. They have learned how to make strong, light boats in which to go out on the water. We say they are a *skillful* people.



The Eskimos depend on wild animals for their living. With spears, harpoons, and bows and arrows, they work very hard to kill enough animals to get a living for themselves and their families. By hunting almost all the time and killing all the animals they can, the Eskimos have been able to get their food, clothing, and shelter.

Changing food supply. For many years now, white men have visited the Arctic lands. Some of these men have



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Hunting seals with a rifle. This Eskimo hides behind a white canvas blind, mounted on a small sled, and creeps up to a seal. If the Eskimo is careful, the seal will not see him.

taught the Eskimos in many places to use rifles. With a rifle a man can shoot an animal from a greater distance. He can kill more animals in a short time.

Since the Eskimos have obtained rifles, they have often killed more animals than they needed for the necessities of life. Sometimes they have wanted furs to trade for steel knives, axes, needles, and other things brought by white men. Sometimes they have wasted animals, allowing them to lie where they fell. So many animals have been killed that there are not enough left to furnish a living for the Eskimos. The families can no longer depend on hunting for their living.

Not so long ago white men brought tame reindeer to parts of Canada and Alaska. They taught the Eskimos how to raise reindeer and how to take care of reindeer herds. Today some Eskimos depend on reindeer to make a living for themselves and their families.

Altogether the number of Eskimos in Greenland and other parts of the north is very small. If you could count all the Eskimos in the world, you might not have half as many people as go to one of our biggest football games. The part of the world where the Eskimos live is large, but only a small number of people make their homes there.

Learning and Doing

Choose three of these pictures which you would like to draw. In your pictures try to show the things which you have read about.

a. An Eskimo harpooning a seal
b. A herd of musk oxen grazing on a tundra
c. An Eskimo in his kayak
d. The outside of an igloo
e. The inside of an igloo
f. Three Eskimos building a snowhouse
g. An Eskimo family moving to a summer camping place
h. An Eskimo woman on a bird hunt

THINGS TO DO

1. If you have deep snow in winter where you live, make a snowhouse as the Eskimos do.

2. Make a list of animals that are useful to people of cold lands. If you cannot spell the names of the animals, find them in the pages that you have read.

QUESTIONS TO TALK OVER

1. In what ways do the Eskimos use seals?

2. Why do not the Eskimos have farms and raise crops?

3. When do the Eskimos move to a new home? Why do they move?

4. Is Greenland an easy place to live in? Give reasons for your answer.

5. How do seals find food in such a cold part of the world?

6. Why do the Eskimos build their igloos on the sides of hills?

7. How does an Eskimo dress to keep warm in winter?

8. What kind of weather do the Greenland Eskimos have in winter?

9. What kind of weather do they have in summer?

10. Describe a walk on the tundra in summer.

11. Do you think the Eskimo has learned the best way to make his living in Greenland? Explain your answer.

12. What tools do the Eskimos use for hunting? Why do most Eskimos hunt with spears instead of guns?

13. Do Eskimos live in as primitive a way as the Canoe People? Show that you are right.

PLACES TO FIND ON THE GLOBE

north pole
south pole
Greenland
Arctic Ocean
Arctic Circle
Antarctic Circle
Alaska
Canada

WORDS TO EXPLAIN

salmon trout
skin tent
polar bear
horizon
reindeer
musk ox
desert
tundra
herd
blubber
antlers
caribou
igloo
harpoon
kayak
seal
walrus
moss

TELLING A STORY

Imagine that you are the Eskimo woman shown in the picture on page 33. Explain how you caught the bird. Tell why the bird did not see you.

A herder and his reindeer. The animals are grazing quietly, and the herder is resting. But he watches carefully to see that no reindeer strays too far away from the herd.

The Reindeer People

Across the north pole from Greenland lies the big continent of Asia. Find Asia on the globe on page 35. Now find Europe on this globe. You can see that Europe and Asia are not separated by water. They are really parts of one great area of land, which is called Eurasia. But Eurasia is usually counted as two continents, Europe and Asia.

Find the part of Asia that is nearest Alaska, where some of the Eskimos live. In this part of Asia live the Reindeer People, who depend on reindeer for their living. Their home is just across the narrow strip of water that separates Asia from Alaska.

HERDING REINDEER

A herder on the tundra. It is summertime in this far northern country. The land is mossy tundra with few trees near by. Chiefly grass and low bushes and moss grow here. A herder is out on the tundra looking after his reindeer. He has reddish skin and is so strong that he can carry a reindeer on his back.

Even though it is summer, the day is cold because this land, like the land of the Eskimos, is in the far north. The herder is dressed in skin clothes. They are his winter clothes, and they are now wearing out. He has on sealskin trousers and a heavy fur shirt which reaches almost to his knees. The shirt has sleeves that are wide and full at the shoulder and narrow at the wrist. The herder's trousers come down over the tops of his boots, which are made of reindeer skin. His cap fits closely and has flaps to cover his ears. Strings on the flaps are crossed under his chin and tied at the top of his head.

The long summer days, when it does not grow dark, have come. But patches of ice and snow can still be seen here and there on the tundra. While the herder watches his herd, he looks far away to the south where there is a forest of pine trees.

A herd of reindeer. The reindeer are eating the grass and moss which grow on the tundra. Reindeer also eat the new leaves growing on the low bushes. If mice or young birds are nesting in the moss, a reindeer may eat them too. Once many of these reindeer were wild. They ran in herds over the tundra and in the forest. The herder captured them and partly tamed them. He now has a fine herd with many *fawns*, or young reindeer. He is rich because he owns such a large herd.

These animals are not large, but they have heavy bodies, short legs, and thick, heavy antlers. Since it is summer, their fat bodies are covered with short, glossy new hair. In the spring they began to lose their old hair, and now the new coat is just growing in. A few of them are as white as snow. Most of the others are brown or dark gray. During the summer they will grow fatter and fatter. But in winter when they can find little food, they become thin.

Although the herder has several dogs, he has not trained them to herd his reindeer. He watches the herd himself. He must see that the reindeer do not run away. Since they are still partly wild, some of the animals may break away from the herd if they have a chance. They would then run wild as they did before their owner captured them.

As the reindeer move to a new part of the tundra, the man must see that none of the animals wander away from the herd. He heads them off before they get far away.

Young reindeer. The fawns are given names according to their color. When they grow older, the herder may give them other names according to the kind of antlers which they have. One of the fawns is black, and the herder calls it a name that means "the all-black one." It is not yet a year old, and its antlers are not full-grown.

If the herder should keep the black fawn, it might live to be twelve or fifteen years old. A few of the reindeer in the herd are almost as old as that. But he will probably sell "the all-black one" because its skin will bring a good price. Black reindeer skins and white ones are worth more than gray skins.

Protecting the herd. The man watches to see that no wild animals harm his reindeer. Black bears, polar bears, and large wolves kill reindeer. Wolves are cruel and cunning and they eat reindeer flesh. If a wolf makes an attack in daylight, the herder tries to lasso it. In winter when the nights are dark and windy, several wolves in a pack sometimes attack a herd. Even if they do not kill the reindeer, they may scatter the herd until the man has few animals left.

The herder has a gun which he uses to protect his herd. The Reindeer People used to shoot with bows and arrows, but for many years they have bought guns and a few other things from traders who come to their part of the world. So we see that the Reindeer People use some things which they do not make themselves.

The herder watches the birds and insects which fly about on the tundra. The birds have come back from the south because it is summer again. Mosquitoes bite the herder and his reindeer. If you were on the tundra, the mosquitoes would buzz about you. They might cover your hand till it would look black. There are also many flies at this time of the year.

Using the reindeer. The reindeer are kept for their skins and meat. When the herder kills a reindeer, he cuts up the meat and hangs some of it up to dry. He saves the best parts for himself and his family and gives the other parts to his dogs. The skins of the reindeer are used to make clothes and covers for beds. The herder uses the antlers in making certain parts of his sleds. The reindeer is very useful to the herder and his family. They could not live in this cold land without the meat and skin of reindeer. They even train some of their reindeer to pull a sled.

New pastures. In this cold country the grass, moss, and bushes grow slowly. The Reindeer People move often so that the herd can find enough food. They move north with their animals in the spring before the snow has melted. After the summer, when the heavy winter snows begin to fall, these nomadic people move south, close to the forests. There they find more shelter than on the open tundra.

Winter grazing. In winter the reindeer live on moss that grows under the snow. They reach this moss by scraping away the snow with their hoofs. The trampled snow soon freezes, and the animals cannot break through the ice to find food. They move on to another place every few hours. The herder does not take his reindeer into the forest, for the snow is deep there. The animals would soon tire of scraping away such deep snow. They would want to lie down before they had had enough to eat.

Near the edge of the forest are some hills that make a good winter pasture. Here the reindeer find plenty of moss. There is not so much snow on the slopes of the hills as on the level ground.

In summer the reindeer find enough water to drink, for water stands in little ponds on the land. In winter when everything is frozen, they eat snow instead.

REINDEER SLEDS

Whenever the reindeer herder and his family move, they ride on sleds and carry their belongings with them. Most herders use reindeer to pull their sleds, but a few use dogs as the Eskimos do.

Training the fawns. The reindeer must be taught to pull a sled. The herder begins to train the fawns when they are half grown. He has two fawns pull an empty sled again and again. Then he hitches them to a loaded one. When it is time to move on to a new pasture, the young reindeer are harnessed to the last of the line of sleds. The animals pull a load which would not be harmed if they should upset the sled. After a few days in harness a reindeer has learned its new work.

Traveling by sled. The driver of a sled uses a whip made of thin birch or willow branches. He snaps the whip to make a sharp sound but does not hit his reindeer hard.

The people riding on a sled sit on cushions made of skins. The sled, made of

Traveling by reindeer sled. It is late winter, and the sun has not yet risen above the horizon. The winter snow covers the tundra except where the wind has blown it away.

wood, usually has a low back rest for each seat. It has thick runners which curve up in the front. A sled is so light that a man can lift it with one hand.

The runners of the sled are smooth and can move swiftly over the snow. As the sled rushes along, the snow-covered land glitters in the sunlight. The snow is so bright that it can hurt the driver's eyes. So he wears snow goggles made of pieces of leather with a narrow slit for each eye. Strings at the sides of the goggles are tied around his head.

The Reindeer People always travel by sled. They stop traveling only in the summer when the snow has melted and the land is wet. Then they stand their sleds up on end until the snow falls again. The Reindeer People never use carts or wagons with wheels. In winter the snow is too deep, and in summer the land is too wet.

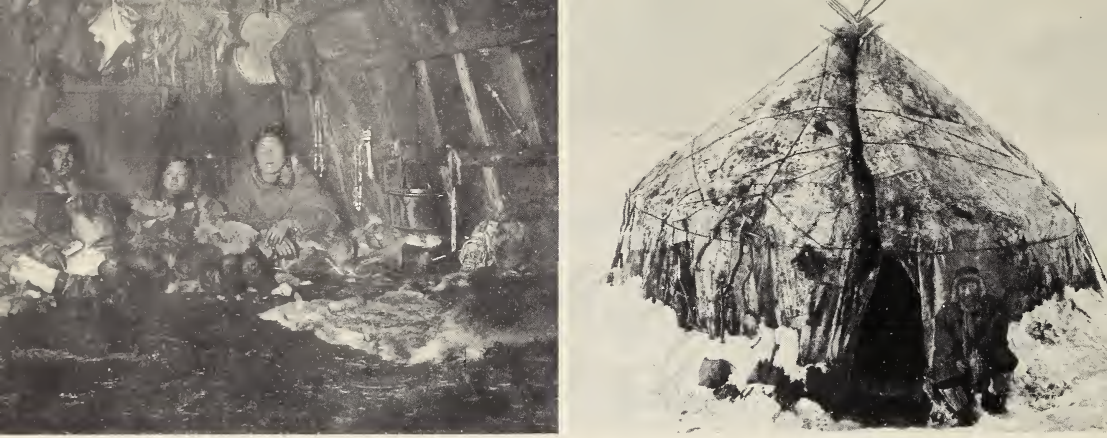
HOME AND FAMILY

One winter afternoon the herder's wife builds a small fire inside her tent. She puts only a few sticks of wood on the fire because wood is hard to find.

The woman, like her husband and her children, has reddish skin. Her eyes are brown. Her black hair is parted in the middle and hangs down her back in two long braids. She is dressed in reindeer skin.

The fire is built in the center of the tent where stones have been placed side by side to make a fireplace. An air hole in the roof lets the smoke out. The fire is kept, not to heat the house, but to cook food. There is too little wood to burn it for heat.

The evening meal. As soon as there is a good blaze, the woman hangs an iron kettle over the fire to boil meat. The



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The inner and outer tents of the Reindeer People. The walls of the outer tent are held down by ropes and banks of snow. Inside the inner tent the family huddle together for warmth.

kettle hangs from a hook made of a reindeer antler. The hook is fastened with a strip of strong skin to one of the poles which hold up the tent.

The woman cooks reindeer meat and makes tea. Her husband got the tea from a white trader who had brought it from a distant land. The trader exchanged the tea for a reindeer skin.

At the back of the room near the wall is a lamp in which oil is burning. A large pot, filled with ice, is hanging over the lamp. The herder's wife is melting snow and ice to get water to cook with. The pot is always kept full of ice in winter.

When the ice in the pot has melted, the woman makes strong tea. The family will drink the tea after they have eaten. They do not use milk or sugar. Next the woman pours broth off the cooked meat and lets the broth cool.

Soon the man and his children, who have been helping him look after the herd, come home. They are hungry after their work out in the cold.

When they are ready to eat the evening meal, they sit cross-legged on reindeer skins spread on the floor. The table is only a few inches above the floor. The Reindeer People tear the meat right off the bones with their teeth. They eat fast and make a great deal of noise. They eat much meat because they do not often have other foods. Their dishes are made chiefly of wood. Some of the spoons are made of bone or of ivory from walrus tusks. At the end of their meal they drink the broth and tea. Their evening meal is the chief one of the day.

The herder's wife does not always cook the meat. The Reindeer People like raw meat frozen hard as well as boiled meat.

If roots or berries can be found in summer, the herder's wife will give them to her husband. He eats raw roots but he likes them cooked now and then in his soup. But the mother and the children are not expected to eat these choice dishes.

The winter home. The house in which the family spends the winter is really made of two tents, an outer tent and an inner one. The outer tent is made of skins placed over a frame of poles and branches of trees. In making the frame three large poles are tied together at the top. Thin poles are fastened to the large poles to hold up the covering of skins. Thin branches cut from trees go around the frame, and there are other thin branches in the roof. This outer tent looks like a bowl upside down. It is so large that it took about forty large reindeer skins to make it.

The skins are laid on the frame the hair side out, but the hair has been cut short so that some light can shine through. Besides an air hole in the top of the tent there is an opening in the front. The opening is used as a door. It can be closed by a flap fastened to the tent.

The inner tent is a smaller one made of about fifteen skins sewed together. In winter the family lives inside the small tent. It is too cold then to live in just one tent. But even inside the two tents, it is often cold.

The Reindeer People cover their floor first with twigs from willow trees. Thick skins are laid over the twigs as a carpet.

This house is just big enough for the number of people who will live in it. When they are inside, the heat from their bodies helps to warm the room. At night they sleep with their heads toward the middle of the room and their feet against the wall. They cover themselves with heavy skins. There is one long pillow for everyone to use. It is a bag made of skins and filled with other skins.

In the morning the covers are frosty, and the herder's wife must dry them. After the herder and the children have left the tent, she takes out the covers and the skins that have been hanging on the walls. She lays all the skins on the snow outside. After they have frozen, she beats out the frost. In this way she dries them for the next night. If she has a neighbor, the two women may help each other. They use snow-beaters made of antlers. The herder keeps his newest and warmest skins for winter. During the summer he uses his oldest skins for tent covers.

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A light movable tent. The herder uses it when he must travel far from the big tent.

The herder has built his house in a clear, level space. There are two other tent houses not far away, but they cannot be seen from the spot where this herder lives. When the three families built their camp, they did not want to live too close together. But they wanted to be near enough to help one another.

Sometimes the herder must stay out on the tundra on cold winter nights. He carries along a light tent to sleep in. The other members of the family stay at home in the big tent. The herder's movable tent will keep off the snow. Before he enters the tent, he beats the snow out of his clothes. He sleeps in a long, heavy overcoat and is comfortable even though he has no fire.

In the olden times the Reindeer People did not live in tents. They used underground houses. Some of these old houses can still be found, but the Reindeer People have not lived in them for many years.

Clothing from reindeer skins. To get material for clothing, the herder's wife carefully skins a reindeer. She cleans the skin with a knife, taking off all the bits of flesh. Then she stretches the skin on a wooden frame to dry. Much work has to be done on the skin before it is ready to use. The woman scrapes it many times and rubs it between her hands to make it soft.

When she makes clothes for her family, she always makes two suits for each person, for the Reindeer People wear two suits at a time. Each suit has two parts — a shirt and trousers. The inner suit is made with the hair on the inside, so that the hair will be next to the wearer's skin. The outer suit has the hair side out. Two suits are not too many to wear at a time because these people live in such a cold land. The two suits are not sewed together. If they are separate, it is easier to dry them in case they get wet.

The shirt of the outer suit is so large that it looks like a big coat. If the herder must sleep out on the tundra and has no overcoat with him, this big shirt helps to keep him warm. He turns up his wide fur collar and pulls the top of his thick fur cap down to his neck. He fastens the outside shirt together and pulls his arms out of the sleeves. His body will help keep his arms warm. He draws his head down inside the shirt. In this way he can be warm enough even if there is a heavy snow. When he rises in the morning, he shakes the snow off his clothing.

The herder's wife also uses reindeer skin to make boots. She uses thick parts of the skin for boots to be worn in winter and thinner skin for those to be worn in summer. She must make many pairs, for the Reindeer People have to change their boots often when they get wet. The woman puts pads of dry grass in the sole just as the Eskimos do. She gathers all the grass she needs in the fall before the heavy snows come.

Sometimes the herder's wife makes a long overcoat to protect the herder from the wind. This coat keeps snow off his other clothes. It comes far below the

Fun in polar lands. The children of the Reindeer People enjoy playing games just as you do. These girls are dancing in the snow.

AMERICAN MUSEUM OF NATURAL HISTORY

man's knees and laps far over in front. To keep it from blowing open, he ties a strip of skin around his waist.

The herder's wife also makes clothes for her children. Until they are about seven years old, their suits are made in one piece with a fur hood fastened on. Older boys and girls wear clothes like those of their parents.

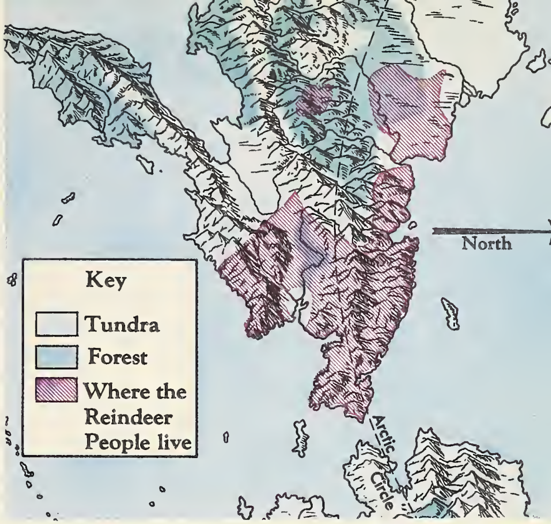
Reindeer People like to wear necklaces, bracelets, and earrings. These ornaments are usually made of strips of skins tied in knots. Sometimes they are made of beads strung on fine strips of skin. Both men and women wear such ornaments.

You can see how busy the herder's wife is. She must work very hard to prepare the skins and make all the clothing for her family. Almost all the materials she uses come from the reindeer which her husband herds.

Moving to a new camp. The herder and his family stay in the same camp all summer. It is near the tundra where the reindeer graze. The animals move slowly along the tundra trying to find enough to eat.

When fall comes, the herder and his family move to new grazing grounds. The herder must use eight or nine reindeer sleds to move the family, the supply of meat from the animals he has killed, the new skins, and other belongings. Early in the morning the sleds are packed, and the man drives off to find a place for a new home. Behind him come the other members of the family on their sleds.

All during the fall and winter the herder moves his family from one place to another. They move to find new pastures for their reindeer. Only families that have many small children stay in the same place for three or four months.



THE LAND OF THE REINDEER PEOPLE

On the globe on page 35 you saw the *region*, or part of the world, where the Reindeer People live. Now find the same region on this map. The tundra on which the Reindeer People raise their herds is in this region. The hills on which the animals graze in winter are inland near the forests. Where on this map do you see mountains? The herder and his dogs sometimes chase wild sheep that live in these mountains. Which way is north on this map?

Cold winters and cool summers. In winter it is about as cold in this part of Eurasia as on the shores of Greenland. In summer it is warmer than in Greenland. But even the summers are cool, and they are very short. The sun is so low in the sky that the sunshine gives little warmth. There are patches of ice and snow on the ground all summer. In winter the sea is frozen along the shores. The wind is strong and cold. There are heavy storms of fine snow. These snowstorms may last several weeks. In the spring and fall when it is not so cold, the snow is wet.

EWING GALLOWAY

Mountain sheep. Their hoofs are padded, and the animals can jump from rock to rock without slipping. Notice their great curved horns and their heavy coats.

Tundra and forest. Along the coast and for many miles inland nothing at all grows except moss and very short grass. The summer is so short and cold that the grass does not grow high. Farther inland from the coast it is a little warmer in summer, and small bushes grow. To the south where it is still warmer there are some forests, but the trees do not grow large.

This land is not an easy place in which to make a living. It is not good for raising crops. The summers are too short to give enough warmth for growing fruits and vegetables. The people have little besides meat to eat.

HUNTING MOUNTAIN SHEEP

The people of this region think that the meat of the mountain sheep is even better than reindeer meat.

These wild sheep are very shy. If a hunter starts after them when they are down on the plain, they will run for the nearest rocky hill. A mountain sheep can jump from rock to rock without falling. So if it reaches rocky land, a hunter cannot follow it easily. The hunter's dogs, however, try to corner the sheep in a spot from which it cannot escape. The hunter follows with his lasso.

Mountain sheep have very thick, curving horns, which the Reindeer People use in making cups, spoons, and other things. The skin of the sheep, covered with soft fur, brings a good price from the traders. But the hunters in this land find many more wild reindeer than mountain sheep.

HOW THE REINDEER PEOPLE TRADE

The Sea People. In this cold Arctic land some families live on the seacoast. They are called Sea People. They have no reindeer herds but make their living by hunting seals, walruses, and other animals, as the Eskimos do.

The Reindeer People like sea food and need sealskins for some of their clothing. But they have no time to hunt seal. They must care for their herds. They seldom have time even to go to the coast. The Sea People like reindeer meat, and they can use reindeer skins for parts of their clothing. But these people do not raise reindeer.

Therefore the Reindeer People and the

Sea People trade with each other. Every spring men from the seacoast visit the reindeer camps. They will give seal meat or skins for reindeer meat and skins. The Reindeer People are glad to trade with the Sea People.

Visiting the Sea People. Sometimes before the snow begins to melt, a reindeer herder can leave his herd in care of his family and friends. He goes to the seashore to trade. He loads his reindeer skins on sleds. He travels slowly so as not to tire his reindeer with the heavy load.

When he reaches the seashore, he goes seal hunting with some of the Sea People. He trades his reindeer skins for sealskins. In the fall he returns slowly, for his sled is again heavily loaded. His family and friends are glad to have the sealskins and meat which he brings back.

Trading without money. The Reindeer People and the Sea People do not have money as we do. The Sea People will trade the skin of a large seal for ten or fifteen fawnskins. Three live reindeer may be worth a large bag of seal oil. Some Sea People may ask twenty fawnskins for a sealskin, and others only eight fawnskins.

Hunting and herding. The man who has a herd of reindeer usually has many young reindeer growing up. His herd keeps getting larger and larger. When he needs meat or skins, he can kill a reindeer. He and his family have plenty of food. They do not have to depend on hunting wild animals. If the hunting is not good, the Reindeer People will not suffer for want of food.

But the Sea People are not so sure of their food. When seals are scarce, the hunters may take long trips on the ice or along the shore to find enough meat to live on. Many people who once lived on the shore have moved inland and are now raising reindeer on the tundra.

Sea People after a successful hunt. They have harpooned a small whale at the edge of the ice, and now they are dragging it home on a sled. They will use every bit of the whale.

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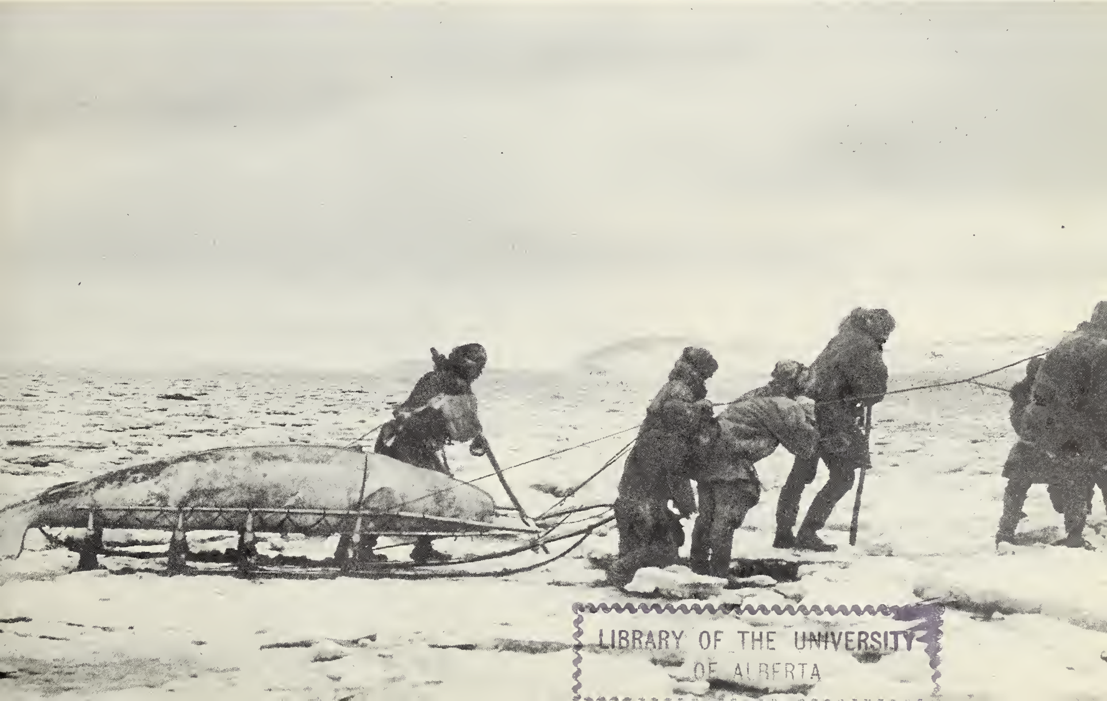

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A SIMPLE WAY OF LIVING

The Reindeer People cannot live in one place for a long time as we do. They must move to new pastures so that their herds can find enough to eat. After they have left a camp, it takes a long time for the moss and grass to grow again. Sometimes the herder does not return to an old pasture for five years.

A nomadic people. Like the Canoe People and the Eskimos, the Reindeer People are nomadic. They wander from place to place. The Canoe People, you remember, are nomadic because they must find shellfish for food. The Eskimos are nomads because they must follow the animals they hunt. But the Reindeer People are nomads for a quite different reason. They must find new pastures for their herds at different times of the year. Later in this book you will read of people who are nomads for still another reason. But all nomads move from one place to another when food for themselves or their animals becomes scarce.

Because the Reindeer People need so much land for their animals to graze on, the families do not live close together. Only a few families live in each camp. There are not many people in all the land where the Reindeer People and the Sea People live.

People in the United States live much closer together than do the Reindeer People. If you live in a city or have visited one, you know that there are some houses large enough to hold hundreds of families.

A good living from reindeer. The Reindeer People use reindeer meat for food and reindeer skin for making clothing and tent coverings. They use reindeer to pull their sleds in moving from place to place. The men raise reindeer as their way of getting a living. If they just hunted and killed wild reindeer, they would soon kill all the animals or scare them away. Instead they capture and tame wild reindeer until they have large herds to use as they need them.

The Reindeer People are much better off than the Canoe People of South America who live mostly on the fish and shellfish they can find. The Reindeer People have a surer supply of food than the Eskimos who live by hunting. The Reindeer People also have more things to use than do people who do not trade their goods with others. They get tea, seal meat, sealskins, and other things by trading with their neighbors or with strangers who come to their land. Their way of living is not so simple as that of the Canoe People, who do not trade, or of the Eskimos, who trade little.

But their way of living is much simpler than ours. In the United States men make their living in many different ways, while in the land of the reindeer most of the people do the same kind of work.

THE POLAR REGIONS

The north polar lands. You have now read about two groups of people who live in the polar regions of the northern hemisphere. As you know, the north pole is in the center of this hemisphere. West of Greenland and just as near to the north pole are many islands, some large and some small. This is one of the world's three largest groups of islands. All along the coasts of the three northern continents — North America, Asia, and Europe — are lands that are very cold most of the year. People and animals and tough plants live in these lands.

People of the far north. The north polar lands no longer seem so far away from parts of the world where many people live. Within a few hours planes can cross the pole from one of the more crowded lands to another. In these far northern lands small numbers of white people have made their homes. A few people from Europe live in Greenland. More than half of the people of Alaska are white people who have moved there from the United States or other countries. The rest of the people are Indians in the south and east and Eskimos in the west and north. In Alaska the white people live much as they would in this country.

The south polar lands. There are no people living in regions around the south pole. Most of the great continent of Antarctica is covered with a sheet of ice thousands of feet thick in places. Around this continent the ocean is cold, often stormy, and covered with floating ice. This area of the ocean is often called the Antarctic Ocean. From Antarctica come the strong, cold winds and storms that blow around Tierra del Fuego. A few men have sailed along the coast of Antarctica, and some have traveled by sled and airplane across its fields of snow and ice, but much of Antarctica is still an unknown land.

Antarctica, land of snow and ice. An explorer is looking at a great wall of ice. This picture was taken by an explorer of the United States Navy early in 1947.

PAUL A. SIPLE

Being Your Own Teacher

How many ways can you think of in which the Reindeer People and the Eskimos are alike? Make a list of these ways beginning like this:

Both live in the far north.
Both use skins for clothing.

If you need to use any words which you cannot spell, look in your book.

See how long a list you can make of ways in which the Reindeer People and the Eskimos are different. Begin like this:

Reindeer People

eat mostly reindeer meat.
live inland.

Eskimos

eat mostly seal meat.
live along the seacoast.

WORDS TO EXPLAIN

mountain sheep
inner tent
northeast
southeast
northwest
southwest
graze
trade
region
fawn
Eurasia
herd

USING MAPS AND GLOBES

1. Tell why one of the western continents is called *North* America and the other is called *South* America.

2. What ocean is east of the continent of North America?

3. What ocean is west of the continent of North America?

4. What ocean is north of the continent of North America?

5. Which half of the world has the more land, the northern or the southern hemisphere?

6. Show which two of these groups of people live close together: Canoe People, Eskimos, and Reindeer People.

7. Now turn back to page 38 where there are little globes showing winter darkness in the far north. Study these globes. Place your classroom globe in the same position that they are in. With a flashlight show how sunlight strikes the earth on December 22. Rotate the earth. Is any part within the Arctic Circle in the light? Next shine your flashlight on the globe to show summer sunlight inside the Arctic Circle on June 21. See page 39.

8. On your globe find North Greenland. Now find the part of Eurasia where the Reindeer People live. Which land is farther north? (Measure with a string.) Which is nearer the Arctic Circle?

QUESTIONS ABOUT THE REINDEER PEOPLE

1. Why have the Reindeer People worked to raise large herds of reindeer?

2. How does the herder take care of his reindeer in summer? In winter?

3. Of what do the Reindeer People make dishes and spoons?

4. Why do the Reindeer People move often from place to place?

5. How do they get sea food?

6. How do the Sea People get reindeer meat and skins?

7. What would the Reindeer People have to do without if they did not trade? The Sea People?

Seeing Geography in Pictures

Your geography book has many pictures. Each one shows you something about the world. Many of these have been made by brave men who went to faraway places to take pictures. The beautiful picture on page 53 was taken near the south pole by Paul A. Siple. He was a Boy Scout when he first went to the lands near the south pole.

EIGHT QUESTIONS

When you look at a geography picture, you should ask yourself, "What does this picture show me about the part of the world I have been studying?" These questions will help you find the answer:

1. How far north or south of the equator was this picture taken?
2. What was the season of the year?
3. What are the houses like in this part of the world?
4. How do the people dress?
5. What do they eat?
6. How do they earn a living?
7. What other interesting facts does the picture show?
8. Who took the picture?

EIGHT ANSWERS

Now turn to page 40 and study the picture of the Eskimo hunting a seal. Read the words under the picture. Try to answer each of the questions above. If you need help, read the answers below:

1. The hunter is an Eskimo. This means he probably lives north of the Arctic Circle, toward the north pole. The snow and ice also show that he lives in a cold climate, far from the equator.

2. The man and the sled make shadows. This means that the sun is shining. There is not much snow on the mountains. It is probably spring or summer.

3. No houses are shown. But since it is too cold for trees to grow, this man probably lives in a house made of skins or rocks. In the winter he may live in an igloo made of snow blocks.

4. The man wears bearskin trousers, a caribou skin jacket, and sealskin boots. His mittens are of fox skin.

5. The man is hunting some animal. This means he probably earns his living by hunting. You can see that he has a gun, a white cloth, and some wood. He probably traded skins for these.

6. Since he is a hunter, he probably eats the meat of the animals he shoots. He lives near the water, so he may also eat fish. From the way the earth looks in the picture he probably does not grow vegetables or grains.

7. The man's sled shows that he can make things. His use of the canvas and the gun shows that he knows what to do with the white man's things. His heavy clothing shows that he knows how to keep warm in his cold land.

8. The small words right under the picture tell that it was taken by someone working for the American Museum of Natural History. This is a famous museum in New York.

Now prepare eight answers for the picture on page 51.

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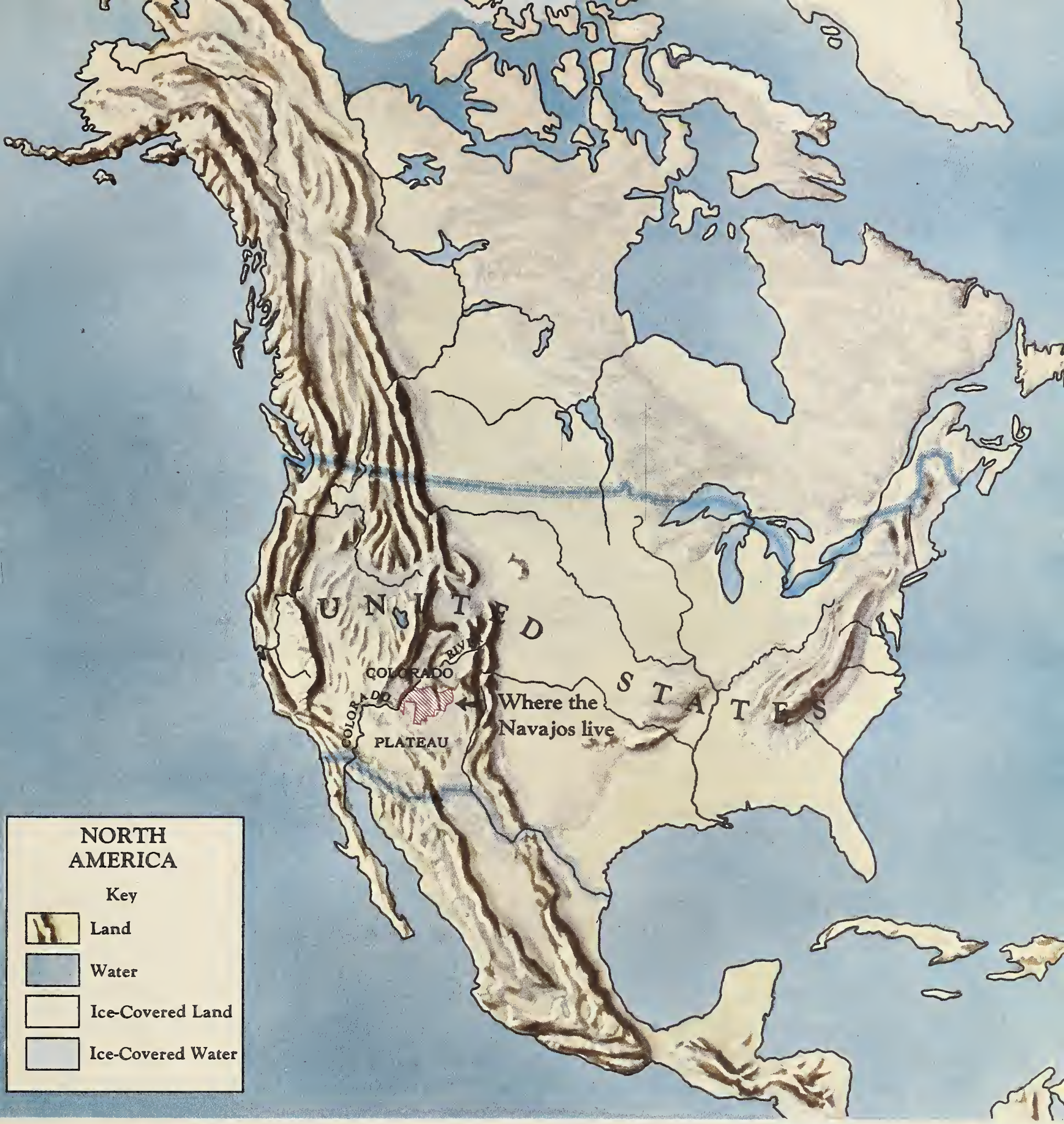
Some of the desert plants that grow in the land of the Navajos. On the left is mesquite. The center picture shows a yucca plant. On the right are thousands of tiny desert flowers.

The Navajo Indians

In this chapter you will read about some Indians who live in the country where you live. Our country is the United States. It is on the continent of North America. The Navajo Indians live in the southwest part of the United States on land which our government has set aside for them. On this map you can see the place where the Navajos live.

The land of the Navajos. The Navajo country is rough desert land. It is an *arid*, or dry, region. If you looked across the desert, you would see that it is covered with low shrubs and bunch grass growing in clumps. There are desert shrubs such as gray sagebrush, and taller plants such as *mesquite* and *yucca*. But the plants do not grow close together. Each needs a wide space in order that its roots may get enough water to live.

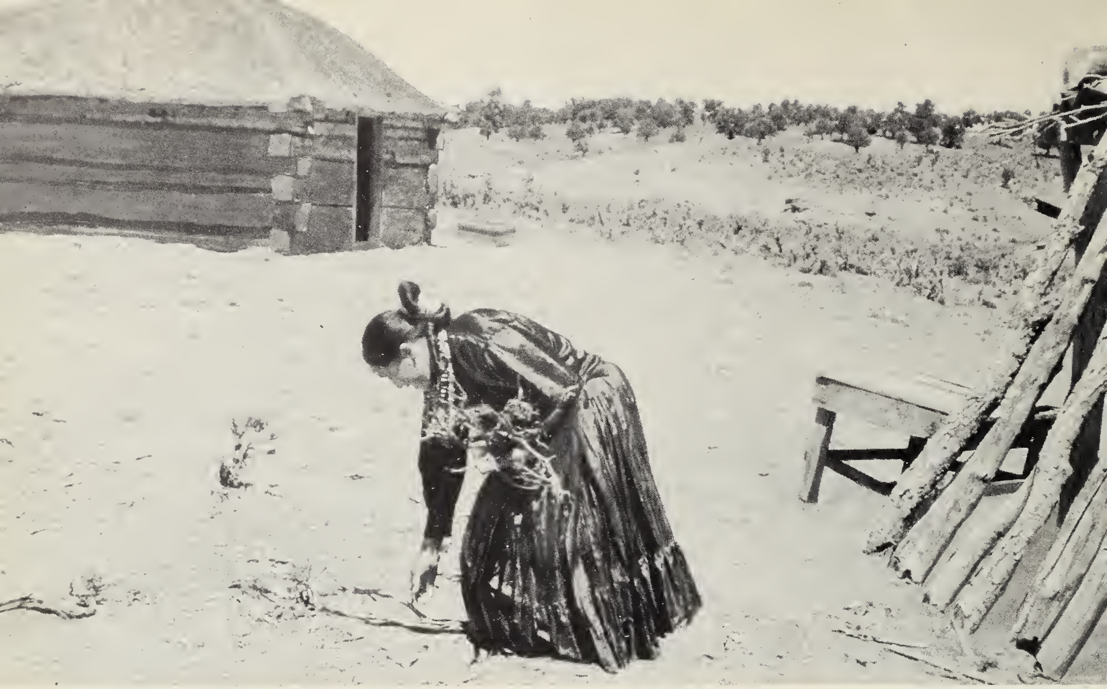
The mesquite is a small desert tree bearing beanlike pods that the Indians



use for food. Its roots are so long that they reach underground water even though the tree may be growing in sand. The Indians use the branches and trunk of the mesquite for wood.

When the yucca plant blooms, it sends up a tall stem from the middle of its long evergreen leaves. On this main stem are creamy white flowers shaped like bells. From the leaves of the yucca the Indians obtain fibers that they use in making baskets.

The rainy season comes in July and August. Then the desert is covered with plants, and the cactuses have beautiful flowers of many colors. When dry weather comes again, many of the plants turn brown and wither.



KONSTANTIN J. KOSTICH

In the early morning the woman goes outside her hogan and gathers brush to make her fire.

A DAY WITH A NAVAJO FAMILY

It is early morning just before sunrise. A Navajo woman is gathering twigs and dried wood, to build a fire in her house. The low house, called a *hogan*, is built of logs covered with mud. The wall of the hogan is circular. The roof is made of sticks held together with mud. A blanket hangs over the door to keep the heat in during cold weather. The door of a Navajo hogan is always on the east side facing the morning sun.

The hogan has been built near the foot of a cliff. Here the hogan is protected from the wind. The weather is cold when the winter winds sweep over the land.

The woman stoops to enter the low doorway. Her skin is reddish-brown, and she has thick black hair and large brown eyes. She places the twigs in the fire hole in the middle of the floor. An opening in the roof lets the smoke out and the light in. There is only one small room. Here the Indian woman and her family both eat and sleep.

A Navajo breakfast. When the fire is burning brightly, the Navajo woman cooks mutton, coffee, and bread for her family. The mutton came from a sheep which she raised. But the coffee came from the *trading post*, or store, where the Indians go to trade.

The bread which this woman makes is a flat cake made of corn meal and fried in fat. The Indians made the corn meal from corn which they raised. But the corn crop is usually small because there is so little rain. Therefore the woman sometimes makes bread of white flour bought at the trading post.

The floor of the hogan is earth which has been packed down hard. Along the walls are sheepskins which the family use to sit on or to sleep on. These skins came from sheep which belonged to this woman.

When breakfast is ready, the dishes are placed on the ground. Then the Indian woman, her husband, and their two little girls eat, sitting in a circle around the dishes of food.

Morning work. After breakfast the woman takes the sheepskins outdoors to air in the sun. She also sweeps the floor and washes the dishes. Next the woman calls the children and takes them with her to herd the sheep. She usually drives the flock out more than a mile from the house to feed on the grass and other plants. Since the grass is thin, the sheep must wander over a wide area to get enough feed.

Herding the sheep. When the children go out in winter to watch the sheep, they wrap cloth around their legs to keep them warm. Often their mother builds a fire for them behind a large rock or in a spot where they are protected from the wind.

The Indian woman has a few goats in her flock. Goats are easy to raise on the arid land since they eat less grass and more of the desert shrubs than sheep eat. The Indians like the meat of goats as well as mutton. They milk the goats too. Navajo babies are fed on goat's milk.

There are not many wild animals to be seen on this desert. There are a few lizards and toads and snakes. In summer the weather is so hot in this dry land that it is hard for animals to live if food and water are scarce. Much of the game that once lived here has been killed.

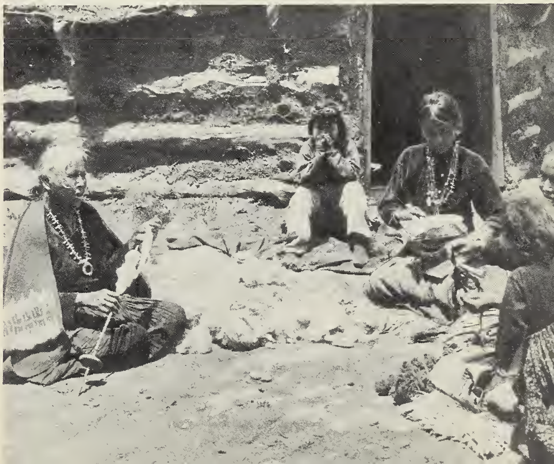
At noon the Indian woman returns home with her children to cook dinner. Sometimes, however, they all stay out on the range with the sheep and goats. Then she and the children have bread and mutton. Or they may not eat at all. Today she prepares squash and beans for the family.

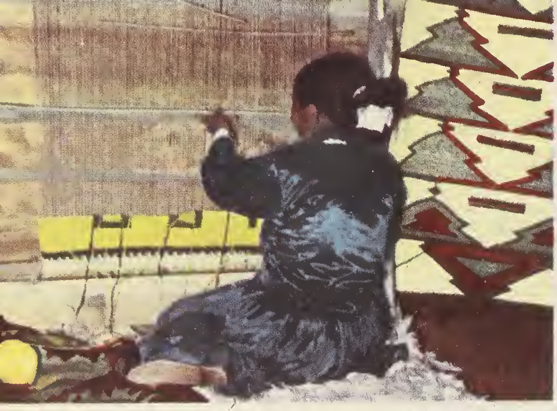
Navajo weaving. In the afternoon the Navajo woman spends a few hours at her weaving. She is making a blanket. She spreads a sheepskin in front of the loom outside the door. Then she sits on the sheepskin with her legs folded under her and begins to weave. Her yarns and tools are near by. She uses yarn of different colors. She learned how to weave from her mother.

Spinning yarn. When she needs more yarn, she stops weaving. She combs wool obtained from her sheep and makes the tiny threads lie side by side. Then she spins these threads together into yarn. The *spindle*, which she uses for spinning, is made of two pieces of wood. One is a smooth, round stick, about two feet long. The other is a flat, round piece of wood with a hole in the center. The round piece of wood is fastened on the long stick like a wheel on an axle. It keeps the yarn on the spindle. After the woman has combed the wool, she ties one end of it on the spindle. Then she twirls the spindle with her hand. This motion

One of these women is combing wool, and another is spinning it into soft yarn. Notice the spindle with the yarn wound around it.

EWING GALLOWAY





KONSTANTIN J. KOSTICH

This woman has finished one blanket and is starting another. Navajos like bright colors.

twists the yarn. The twisted yarn is wound on the long stick. Usually the yarn is crisscrossed like hanks of yarn in the store.

Since the Navajo woman often spins as she walks, it is easier for her to use a small spindle than a large one. She can spin yarn as she walks about the pasture watching the sheep. Many years ago in some parts of our country, women used a large *spinning wheel* to spin wool into thread or yarn. But Indian women have never had spinning wheels.

Watering sheep. Few streams in the Navajo country have water in them the year round.

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Dyeing the yarn. The Navajo woman colors the yarn with dyes which she bought at the trading post. There was a time when a Navajo woman would make her own colors. While she herded her flocks, she would gather roots, leaves, flowers, and particularly colored rocks that are found in this region. She used these in making colors to dye her yarn.

As this woman weaves, she makes a beautiful design in the blanket. It is her own design. Even if she were given a pattern to copy, she would change it just a little. She does not like to follow a pattern exactly.

Evening in the desert. Before the sun goes down, the Navajo mother stops weaving. She goes to the pasture and helps the children bring the flock back home. She drives the sheep into the pen for the night. Then she prepares supper.

Now the sun can no longer be seen. For a time after it has dropped behind the peaks, the western sky is yellow gold, changing to pale green. Banks of clouds above the distant mountaintops are colored deep red and orange. Far in the southwest the mountains look black against the bright sky. Then the color fades away, and the mountains become dimmer and dimmer. The dark shadows close in around the Indian home on the desert.

NOMADIC HERDING

The Colorado Plateau. The land where these Indians live is high and fairly level tableland, called the Colorado Plateau. Find it on the map on page 57.

KONSTANTIN J. KOSTICH

The mother and her children drive the sheep into the pen for the night. The pen is built of poles cut from trees that grow along the few small streams in the Navajo country.

This dry plateau is cut by many *canyons*, or narrow valleys with steep sides. Some of the canyons are small. Others are very deep. A long way off, around the Navajo country, are mountain ranges and peaks.

Water for the sheep. There are no streams near this Indian's house, yet the Indians always know where to find water. There are a few springs. You remember that a spring is a place where water flows out of the earth. There is also water underground. During the dry season the Indians reach this water by digging wells in the bed of a dry stream. During the rainy season streams flow in the canyons. There are other places where water comes out drop by drop between the rocks or where a hollow in a rock holds water.

In winter the sheep can get along with very little water and have to be driven to water only once or twice a week. Sometimes there is snow on the ground, and the sheep eat it. In summer they must go often to the place where they get water. The woman drives the flock to the water which is nearest to the pasture where they are grazing.

For the family's use the Indians carry water to their homes. Sometimes they use a bucket, other times a barrel brought in a wagon.

The sheep of the Navajos. For many years the Navajo Indians have raised sheep. The wool used in the beautiful Navajo blankets comes from the sheep. The skins on which the family sleep are sheepskins.

When the Navajo woman wants some fresh meat, she kills a sheep and cuts up the meat. She hangs it high on a pole where dogs cannot reach it. She scrapes and dries the skin for use as a sleeping mat. Sometimes she cuts meat into thin strips and hangs it up to dry. Dried meat will not spoil as fresh meat does.

Shearing the sheep. In May or June the sheep are sheared. Every member of the family takes part in the shearing, but most of this work is done by the Indian mother.

After the wool is sheared, it must be washed clean and free from grease. To wash the wool the Indian woman uses water in which she has soaked the roots of soapweed. This is a plant of the yucca family. When the wool is dry, she pulls it apart into little bunches. It is then ready to be combed and spun into yarn.

Most of the Navajo sheep are white.

U. S. INDIAN SERVICE

Dipping the sheep in a dipping tank. The women push the animals' heads under water.

But some are black, and a few are brown. Some of the white wool is dyed different colors so that the woman can weave pretty designs in her blankets. She twists together the black and white threads to make gray.

Dipping the sheep. Twice every year the sheep are dipped so that they will stay healthy. Drugs added to the water in which sheep are dipped kills ticks and other insects harmful to sheep. The Navajo man lifts the sheep into the narrow tank. His wife pushes their heads under water. Until recently the Indians did not dip their sheep. But now our government requires every owner of sheep in our country to dip his sheep in order to kill the harmful insects. The Indians have had better flocks since they have done so. They get more wool at shearing time.

Finding summer pastures. In the spring when the weather begins to be hot and dry, the sheep cannot find enough to eat near the Indians' winter home. The Navajos therefore move to other pastures on higher land.

The Indian man, the Indian woman, and the children start out, taking along everything they own. They drive their flock of sheep and goats and a few ponies. Their dogs go along with them. The father takes a gun with which to hunt rabbits and to protect his animals from coyotes. He also takes blankets on his saddle, for the desert is cool at night.

The man drives the ponies. They are small but very strong. They can easily carry a man. The ponies carry the sheepskins, the food, and the loom on which the woman weaves blankets. Then come the sheep and goats. They nibble on bushes and dry grass as they move slowly along. The woman and her children follow on foot.

The country through which the family and the sheep pass is part of the Colorado Plateau. But it is higher than the other land near by and cooler in summer. However, this higher land is also very dry, and watering places may be far apart. To find enough food and water for the sheep, the family must herd them over a large area.

Traveling on the plateau. It is not easy to travel over the plateau. After the Indians have gone just a little way, they come to a deep dry *gully.* This was cut by a swift stream that flowed after a rain and later dried up. When the stream rushed through the gully, it cut away and picked up earth from the sides and bottom. The sand and gravel in the earth were carried along by the rushing waters. The fine soil was all washed away. After the rain stopped, no more water flowed, and the gully dried up again. The sand and gravel were left at the bottom. Year after year this happened with hard rains. Each time the gully became deeper. The Indians often have to cross over gullies like this one.

Because there are so many gullies, large and small, the Navajo country has a very

EWING GALLOWAY

Cliffs and canyons in the Navajo country. Note the many gullies leading to the deep canyon.

rough surface. The gullies lead to larger canyons. The Indians must go down the steep sides of the canyons and then climb up again on the other side. The sides of many of the canyons are steep cliffs, colored brick red and yellow. They are beautiful but hard to climb. Often the Indians have to go along the bottom of a canyon until they find a sloping trail leading out of it.

Camping on the plateau. At night the Indians camp wherever they happen to be when darkness comes. The man builds a crude shelter of brush. For a frame he uses two forked poles with another pole along the top. He leans sticks against this frame and covers them with brush. His summer house is quickly built. Sometimes he just piles up stones to make a wall which will protect his family from the wind. The woman spreads out the sheepskins for her family, and they all go to sleep.

The Indians keep moving slowly all summer until the rains begin. Since there is little for the sheep and goats to eat, they must graze over a large area. When the Indians move from one pasture to another, they build themselves a new shelter. Beside the shelter the woman sets up her loom and continues weaving a blanket. In very dry years the sheep are kept in the canyon bottoms where there is almost always something for them to eat. They are also driven into the mountains to the southwest of the Navajo country to eat the grass which grows there.

NAVAJO TRADE

Visiting the trading post. At last this woman has finished making the beautiful Navajo blanket. Today she takes it to the trading post. She has to ride several hours on a pony, for the trading post is a long distance from her hogan.

The trading post is a long, low building made of wood. In the front part is the store where the trader buys and sells things. At the back are rooms where goods are stored and where the trader and his family live. A white man and his wife run the store. They have a young Indian man to help them.

The Navajo woman gets off her pony. She takes her blanket inside. In this store there are many things that the Indians wish to buy. There are canned

KONSTANTIN J. KOSTICH

The woman rides away from the hogan on her way to the trading post with her blanket.

foods and other groceries. Also there are saddles, bright calicos, velvet, red and blue corduroy, and blankets that were made in factories in other parts of the United States. Since hundreds of Indians come to the trading post, the trader tries to keep a large supply of goods on hand.

The woman did not bring any money to the store. To pay for the things she wants she will give the beautiful blanket which she has woven. The trader lets the Indians pay for their purchases with sheep, wool, skins, hand-made jewelry, and other things. He has lived among the Indians for many years, and he speaks their language.

Trading without money at the trading post.

KONSTANTIN J. KOSTICH

Trading a blanket. Laying her blanket on the counter, the woman looks around at the cans of food on the shelves. Then she nods and points to something which she would like to have. That is her way of asking the price. She asks about only one thing at a time and thinks about the price. Then she may buy it. Next she nods at something else. But she always buys only one thing at a time. She spends a long time in the store choosing the things which she needs.

The trader waits patiently while she is looking around. He knows that he must not try to hurry her. At last she gives her blanket to the trader. In return he gives her coffee, flour, sugar, crackers, and tomatoes. She also buys candy for her children and bright calico to make a dress. She knows how much she ought to get for her blanket. Often the trader will tell an Indian woman before she makes a blanket what he will pay for it. After the trade has been made, the Indian woman mounts her pony and rides away with the things which she bought with her blanket.

Trading without money. An Indian woman spends many hours preparing the wool for a blanket and weaving it, but she cannot buy very many things with one blanket. However, by trading blankets and other things they have made, the Navajos get many things which they cannot grow or make. They do not have to eat mutton all the time. They can also enjoy other foods. They do not have to wear clothing made entirely of wool or sheepskins. They can have other kinds of clothing as well. They may have anything for which the storekeeper will let them pay in trade. They take in trade things which the trader has in his store. They receive no money in the trade, nor does he. Trading without the use of money is called *barter*. Primitive or partly primitive people often trade by barter.

A NAVAJO SILVERSMITH

The Navajo men often decorate their leather belts and saddles with silver work. We get silver by digging it out of the earth. We say that we *mine* the silver. A mine is the place in which we dig up metals or other minerals. Silver is mined not far from the Navajo country. It is one of our most useful metals. In many countries silver is used for money.

Some of the Navajos are *silversmiths*. They hammer silver into rings, pins, and bracelets. The Navajo silversmith has a few simple tools and a small anvil on which he hammers the silver.

A silver necklace. Sometimes the Navajo silversmith makes hollow silver beads. He beats out his silver into a flat piece. When it is ready, he draws a circle on it with a sharp-pointed tool. The circle will make half a bead of just the right size. Then the silversmith cuts out the circle with large, strong scissors that he bought at the trading post. He will use this circle as a pattern for other pieces.

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This silversmith's anvil is a piece of rail.

Out of each circular piece of silver he makes a little half bead. After he has shaped the half beads, he makes a tiny hole in each one so that it can be strung on wire. He smooths off the edges with a file that he bought. Then he joins the halves together to make a whole bead. He polishes them until they shine and then strings them to make a necklace. He will sell the necklace to the trader just as his wife sells her blankets.

The Navajo lives in a land where he can easily find pretty colored stones. He cuts and polishes them and uses them in bracelets and rings. Navajos often wear the stone that we call *turquoise*. It is a green-blue stone which is easily cut with the silversmith's tools.

THE RAINY SEASON

The rains come in late summer, as late as August or September. Almost every year there are some showers, but they do not always come in the same region. Sometimes a region may not have rain for several years.

Sudden showers. When it rains in the Navajo country, it is likely to rain hard. There are sudden heavy showers that do not last long. Sometimes during thunderstorms rain can be seen falling, but it disappears into the warm, dry air before it reaches the ground. In such cases we say that the water *evaporates*.

After the first rains, the grass begins to grow rapidly. Many desert plants turn green. Soon bright blossoms appear. Now the Indians can return to their winter home, for the sheep will find a new growth of grass on their winter range.

Much of the rain water runs off through the gullies. Some of it sinks quickly into the sandy soil. Sometimes a little spring rises later from the water which has gone underground. Many springs last only a short time, but some will last all through the dry weather. The Indians make use of this water for their sheep.

Desert streams. Rain falls most often in the mountains. If there is a heavy rain, water pours down the sides of the mountains in swift streams. The water rushes down the slopes and out over the plateau at the foot of the mountain. But as it flows over the hot dry land, the stream gets smaller and smaller. Part of the water evaporates, and part sinks into the ground.

These streams flowing down from the mountains cut canyons in the plateau. Over many thousands of years the canyons have become deeper and deeper. Sometimes there is enough water in the bottom of a canyon to continue flowing all the way to a river. The river in turn flows into the ocean. Some streams may end in a lake. Others flow until the water sinks into the earth or evaporates, leaving a dry stream bed covered with sand and gravel.

FARMING IN THE NAVAJO COUNTRY

The Navajo Indians do very little farming. There are few parts of the desert that can be farmed without irrigating the land. Few of the Navajos have tried to bring water to their fields for irrigation purposes. It would have to be brought a long way. Costly dams and long irrigation ditches would have to be built.

Vegetable gardens. Sometimes the Indians have small gardens where they raise corn, beans, melons, and squashes. They make their gardens in areas that are not so dry as the rest of the land. The man and his family eat the vegetables that grow in their garden. The corn and beans may be left in the field until they dry. If the Indians raise onions, they let some of the onions grow large and then hang them up to dry. The Indians usually grind their own corn into meal.

Farming with irrigation. In a few places the Navajos have been able to irrigate their land. Some Indians have found a stream and have dug ditches to bring the water to their fields. Sometimes it rains very hard in the summer, and a stream floods the land. The stream becomes so full of water that it overflows its banks. When this happens, the Indians can have a farm on the land which was made wet by the flood. They can raise alfalfa to sell to the trader for money. Because these Indians make money in this way, they have better homes than most of the other Navajos.

Sometimes an Indian has two farms. One farm is in the mountains. There he raises wheat, oats, and potatoes, which grow where it is cooler than in the valley. His other farm is in the valley and is planted with squashes, melons, and corn.

Today most Navajo farmers put fences around their farms. But they used to mark off their fields in other ways. They might plant two rows of corn around their field or dig a ditch around it.

Burning the fields. In the spring the Indian burns over his field to remove the brush. If there is a tree on the land, he sets fire to the lower part of the trunk. He kills the tree so that it will not take water from the soil. If there are stones on the ground, the Indian farmer removes the small ones. He leaves those which he cannot carry away.

Planting and cultivating. Corn is the first crop to be sowed. Melons may be planted next. Then squash seeds are planted. Beans are the last to be sowed. But they are ready to be picked before the other crops.

The Navajo farmer cultivates his crops with a hoe two or three times after the seeds are planted. He used to make a hoe of bone or wood, but now he buys an iron hoe at the trading post. The Indian begins hoeing his field early in the morning and keeps working until the day becomes hot. Then he rests until late afternoon. Again he works in the field until the sun goes down.

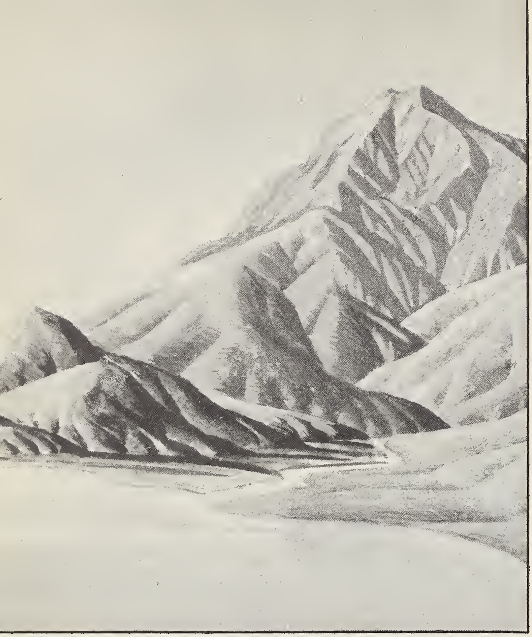
Every year the farmer saves seeds to plant the next year. While the dry cornstalks are still standing, he goes through his field and picks the best ears. He leaves the husks on some of the ears and hangs the corn up in his house.

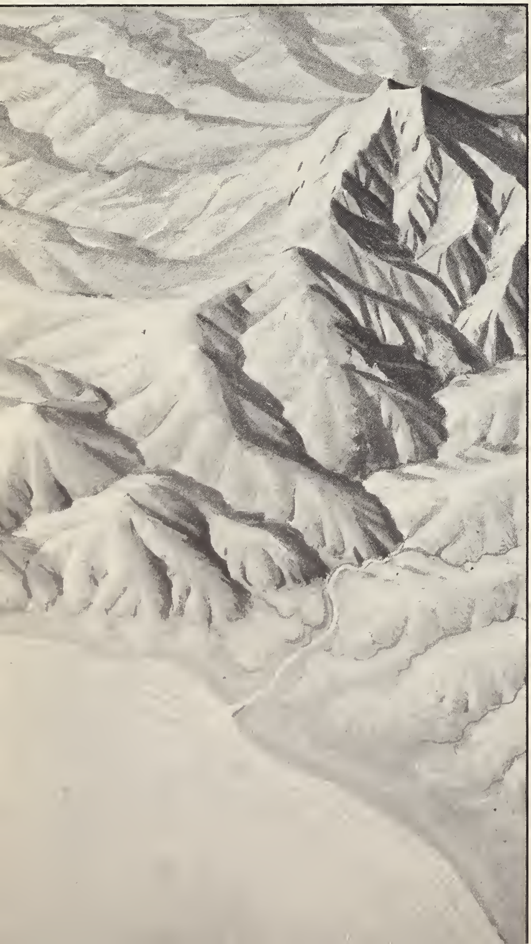
MILTON SNOW

A Navajo farmer hoeing in his cornfield.

Storing crops for winter. The farmer stores some of his crops for winter in pits dug in his field. He builds a fire in a pit to make the ground hard and dry. Later he covers the bottom of the pit with dry bark of trees. As he fills the pit with ears of corn, he puts bark on the sides. The farmer also stores squashes, beans, and other crops.

Farming and rain. In this dry land crops do not grow unless rain comes in the summer months. Even then the *growing season*, or time in which crops grow, is short. In the summer the Indian farmer and his neighbors always watch the weather to see if there will be rain. The Navajos tell many beautiful stories about the clouds, the lightning, and the rain. Also they tell stories about corn, the other crops they grow, and the things which they see every day.





A MAP SHOWING THE HEIGHT OF THE LAND

The Navajo country is only a small part of the great continent of North America. On this continent are ranges of mountains and also high mountains off by themselves. In other places there are low hills and great level plains.

A view from an airplane. Look at the first picture on this page. It shows a high mountain near a seashore. The mountain appears as you might see it from an airplane flying close to the water. Notice that this mountain seems to rise into the sky from the water's edge. This water is part of the great ocean.

As you know, the surface of any body of water is level when the water is still. The level the ocean would reach if it were still as the water in a pail is called *sea level*. Land at this height is said to be at sea level. The height of all land, whether it is near or far from the sea, is measured from sea level.

Where do you see the lowest land in the picture? The land rises gently from sea level to the foot of the mountain and then steeply to the mountaintop. What part of the land is highest above sea level?

A picture that looks like a map. The lower picture on this page shows how the mountain would appear from a plane flying high above the land. You are looking right down on the earth. You can see the outline of the seashore. You can see a river. The mountains seem to be flattened out. The picture looks very much like a map.

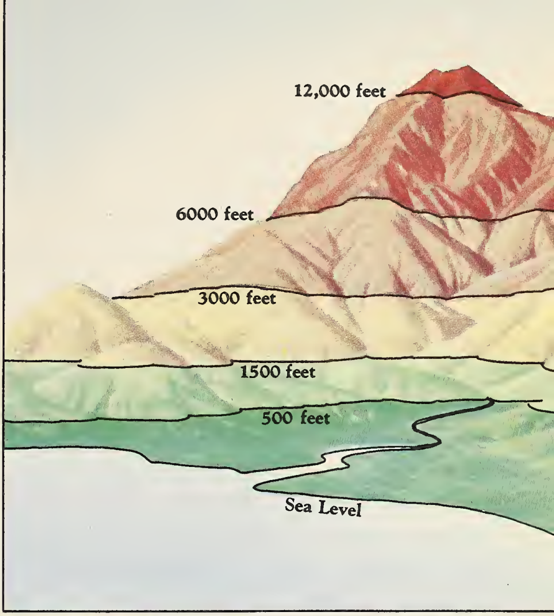
Using colors to show elevation. Look again at the first picture. Now look at the first picture on page 69. Both pictures show the same mountain. But the artist who made the picture on this page has marked off the mountain into layers of different colors. The colors on the land show how high it is above sea level. That is, they show the *elevation* of the land Find sea level.

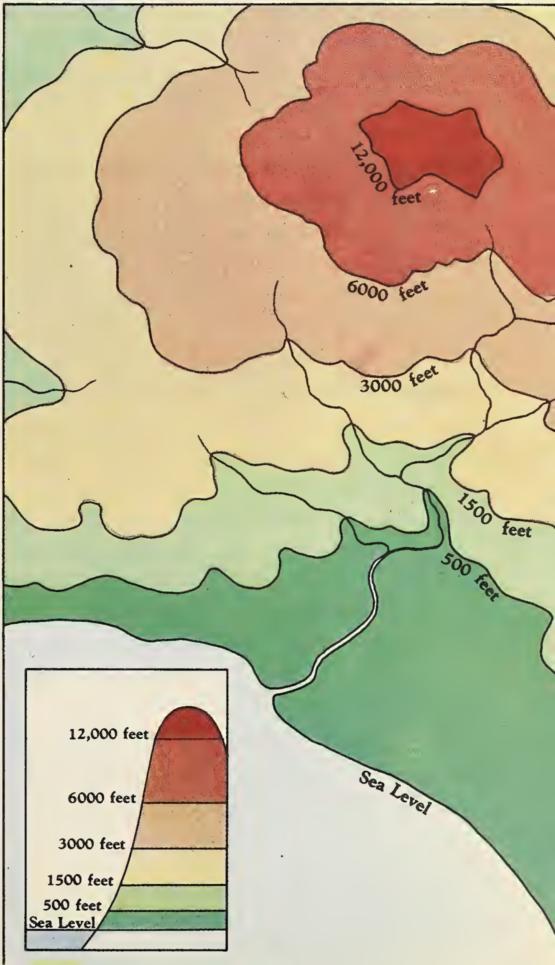
Imagine that the mountain itself has been painted as the artist has painted the picture. If you were climbing this mountain, you would have to climb 500 feet above sea level, or about the height of a tall building, to reach the top of the dark green layer. Land from 500 to 1500 feet above sea level has been painted light green. If you were walking on this part of the mountain you would always be more than 500 feet and less than 1500 feet above sea level. Now look at the area painted yellow. You can see steep slopes, valleys, canyons, and a hill standing off by itself. All this area is more than 1500 feet above sea level. How high must you climb to leave the yellow area? What color is used for the mountaintop? Dark red shows all land 12,000 feet or more above sea level.

An elevation map. Now imagine that you are in a plane looking right down on the painted mountain. This map shows how the colors would appear to you. You cannot see the land really rising from the sea to the mountaintop. You cannot see real hills and valleys. Yet you can tell how high the land is. How can you tell?

A key is in the lower part of the map. To help you learn quickly what elevation a color stands for the key itself is shaped like a mountain. Dark green shows all the land from sea level up to 500 feet. What color stands for the highest land? What color stands for the lowest land? Explain what each of the other colors stands for.

See in the picture how the river flows down from the mountain to the sea.





Rivers, you know, always flow from high land to lower land. Now look at the river on the elevation map. How can you tell the direction in which it flows? On an elevation map you can always tell the direction in which a river flows.

THE NAVAJO WAY OF LIVING

The Navajos are the largest Indian tribe living in the United States. For many years these Indians have been shepherds, and only a few have farms. The region in which the Navajos live is good for raising sheep. The Indians depend on sheep for their food, for the wool with which to weave blankets, and for skins on which to sleep. If they had no sheep, the Navajos would find it hard to get their living in this region.

Nomadic herding. Like the Reindeer People the Navajos must find new pastures for their animals at different times of the year. In northeast Eurasia food for animals is scarce because the weather is cold. Food is scarce in the Navajo country because the land is dry. Neither the Reindeer People nor the Navajos have fixed homes. They are nomads, who move from one grazing ground to another.

In a dry land grass and bushes take a long time to grow, and today there is not enough pasture for all the sheep that the Navajos need for their living. The Indians cannot get their living by farming because crops can be grown only on the small part of the land which can be irrigated. Therefore, our government is now helping the Navajos to make more things to sell and to find other ways of getting their living besides herding sheep.

Trading by barter. The Navajos do not live in so simple a way as the other peoples whom you have read about in this book. Because they trade their *products* at the trading post, they may have many different things. A product is anything useful that you make by your work, gather from the earth, or raise on a farm. The chief products of the Navajos are mutton, sheepskins, silverwork, and blankets. The Indians go often to the trading post and exchange these products for other things that they want. A railroad runs near the Navajo country. At many stations Navajo women and men sell jewelry and blankets to travelers. The Navajos use the money they get to buy other things. But most of their trade is carried on without money.

Using products of other peoples. The things which the Indians buy at the trading post may have been brought there from a long distance. They buy canned foods put up in other parts of the United States. The tin with which the cans are covered may have come from another country. The iron hoes which the Indians buy were made in some large factory far away from the Navajo country. So you see that the Navajos do not get their living, as the Canoe People do, entirely from the region around them. They also use the products of far-away places.

The Indians often leave the part of the country where they have been living. Soon there is nothing to show that people have lived there. The Indians take their hogans apart and move the logs on horseback. These logs will be used in building a new home. The summer rains wash away the mud which had been used on the roof and walls of their houses. Desert grasses and shrubs soon grow where the gardens have been. Even though the Navajos do not live in the simplest way, their way of living is not complex enough to leave lasting signs on the land.

Using What You Have Learned

Bring to school anything you can find on Navajo Indians. You might find pictures of Navajo life, books about the Navajos, or things they have made.

THINGS TO TALK AND THINK ABOUT

1. Why do more Navajos make their living by raising sheep than by farming? Be sure to tell not only about the land but about the uses which the Navajos make of the land.
2. What work do the Indian women do?
3. What work do the Indian men do?
4. Where do the Navajos find water for their sheep?
5. Why do most of the Navajos move around?
6. Do we have any other nomads in our country besides the Navajos?
7. Tell whether each of the following people is a nomad:
   - *a.* The gypsy
   - *b.* The traveling salesman who is away from home most of the time
   - *c.* The hired man who goes from farm to farm to help with the harvest
   - *d.* The man who, the year round, drives a car loaded with his family and everything they own from one tourist camp to another and does odd jobs along the way for a living
8. Why do we say that the Navajos have a simple way of living? What people have a more simple way of living? A less simple way of living?
9. What might you see if you went to a Navajo trading post?
10. Would the Navajos suffer if the people in our country stopped working?
11. How do the clothes people wear show whether their way of living is simple or complex?

MAP STUDY

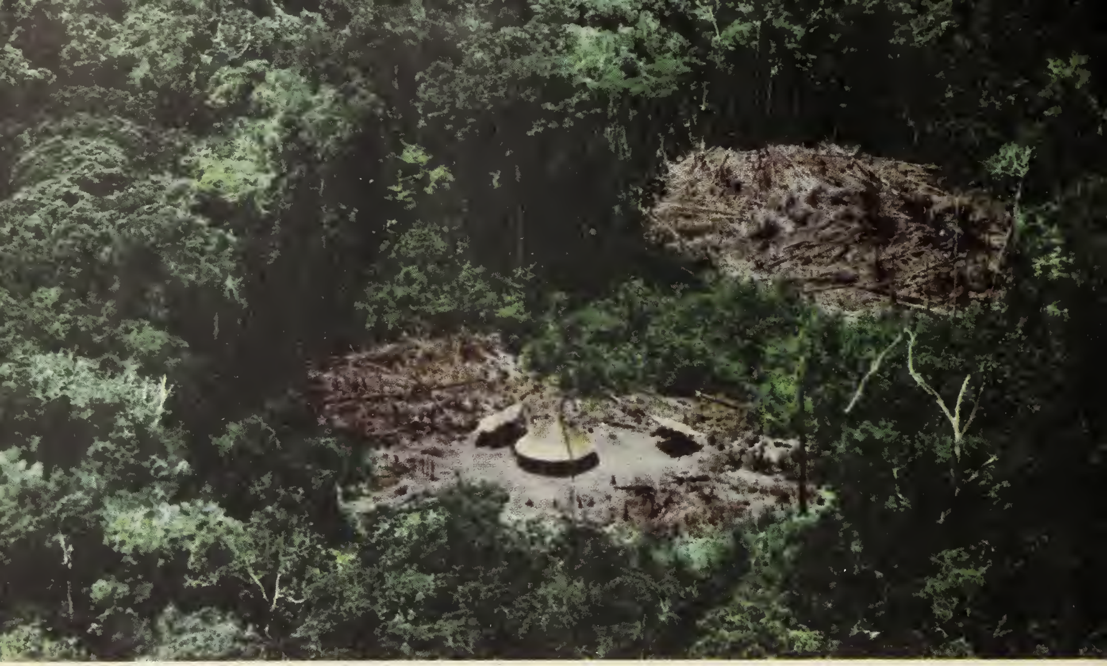
1. On a globe point to each of the seven continents and name them. On what continent do the Navajos live?
2. In what hemisphere do they live?
3. Show the four main directions on a map. Turn the map partly around. Show the directions again. Have they changed in any way? Explain your answer.
4. Show the in-between directions: northeast, northwest, southeast, and southwest. To what part of the United States would you travel if you wanted to see how the Navajo Indians live?

WORDS TO EXPLAIN

mine (silver)
spring (of water)
range (pasture)
growing season
turquoise
silversmith
evaporate
loom
canyon
gully
desert
metal
area
arid
mutton
cactus
barter
plateau
spindle
fire hole
product

DRAWINGS TO MAKE

1. Copy a drawing of a Navajo blanket and color your picture. Choose a blanket which has a design that you like.
2. Draw one of these and write the name below your picture: Inside a Navajo trading post; A Navajo house; Sheep at a watering place; A Navajo woman at work.



HAMILTON RICE EXPEDITION

Beyond the clearing where the house stands the Indians have cleared land for their farm.

The Forest Indians

THE HOUSE IN THE FOREST

There is a dense forest in the region where the Forest Indians live. In the depths of the forest is a clearing. About in the middle of the clearing there is a large round house. It is just before sunrise, but already the air is very warm. There is a sound of voices. The noise comes from the house, where the Indians are getting up out of their hammocks. Altogether there are fifty persons who live in this house. They belong to different families, but are all members of the same tribe.

The Forest Indians are not tall. They have brown skins and straight, black hair, which is cut to make their heads look round. Often they paint their bodies with strange designs in red, yellow, and black. They wear little clothing, for it is always warm in the region where they live.

Inside the house several small fires are kept burning, one for each family. An

Indian puts wood on the fire and blows hard to make a flame. The fire blazes up and lights the inside of the house. The roof is pointed like a circus tent and is held up by poles cut from young trees. There is no hole or chimney in the roof to let the smoke out. Though the house has no windows, in one wall there is a wide opening for a door. The opening is covered with a mat made of large leaves, which is used to keep out insects.

Sharing the house. The middle of the house is the place where the children play and the families gather. Each family has another part of the house for its own use. There the mother does her cooking. Around the fire are the hammocks where the members of the family sleep. Each person has his own hammock hanging from poles which have been placed in the earthen floor. Because the weather is always warm, bed covers are not needed. The Indians store their belongings up under the roof of the house. Pots, baskets, and other things can be seen hanging near the roof. In one part of the house the chief of the tribe and his family have their hammocks. The chief lives much like other members of the tribe. He does not have much power. But he is allowed more space for his part of the house.

The Indians eat only a light breakfast. They have nothing more to eat until they return home in the evening.

Going to the river. After the sun rises, all of them go to the river for their daily bath. The girls take big jars in which to bring back water. To reach the river the Indians must follow a path through the forest. They have built their house in the woods where enemies cannot easily find them. Some Indian tribes live right on the riverbank. But most families feel safer if their house is built in the forest. Then it cannot be seen by enemy tribes coming down the river in their canoes.

Along the banks of this river, trees and bushes grow right to the water's edge. In some places the trees and vines reach out over the water. Frogs and toads hop about near the river.

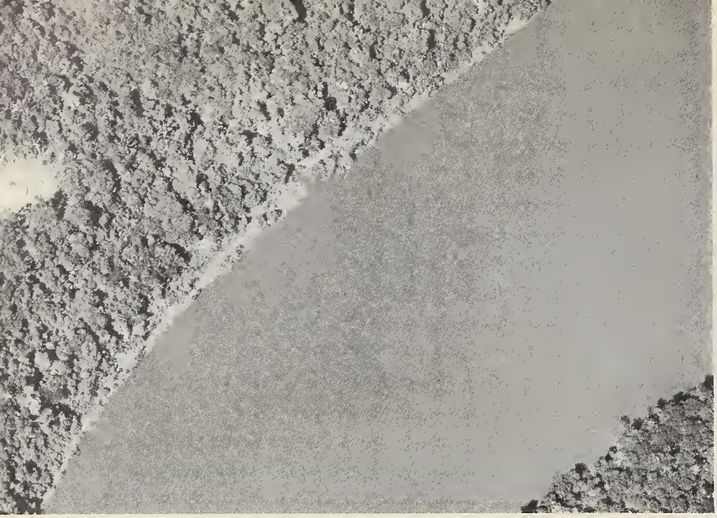
As the Indians come to the river, they see many turtles. A few *alligators* lie in the water or along the banks. Alligators are like the lizards which you may have seen except that they are much larger. Sometimes alligators lie in shallow water with their nostrils barely showing on the surface. They are waiting to catch a fish or some other animal for food.

While some of the Indians bathe in the river, others look out for alligators. The Indians are afraid of alligators because they sometimes attack and kill people in the water. On land a blow from an alligator's tail is as dangerous as the snap of its jaws.

After the Indians have bathed, the Indian girls fill their big jars with water. Each girl puts a jar on her head and starts back to the house.

WHERE THE FOREST INDIANS LIVE

You have already learned about the Canoe People who live farther south than any other people in the world. You have read of the Eskimos and the Reindeer People who live in different parts of the far north. You have also read of the Navajo Indians, who live in the United States. The Forest Indians, about whom this chapter tells, live in South America, the same continent on which the Canoe People live. The Forest Indians live in the southern hemisphere as the Canoe People do. But the Forest Indians live much nearer to the equator.



HAMILTON RICE EXPEDITION

Looking down on a broad river that flows into the Amazon. In a clearing, away from the river bank, you can see the house. It is well hidden from enemies traveling on the river.

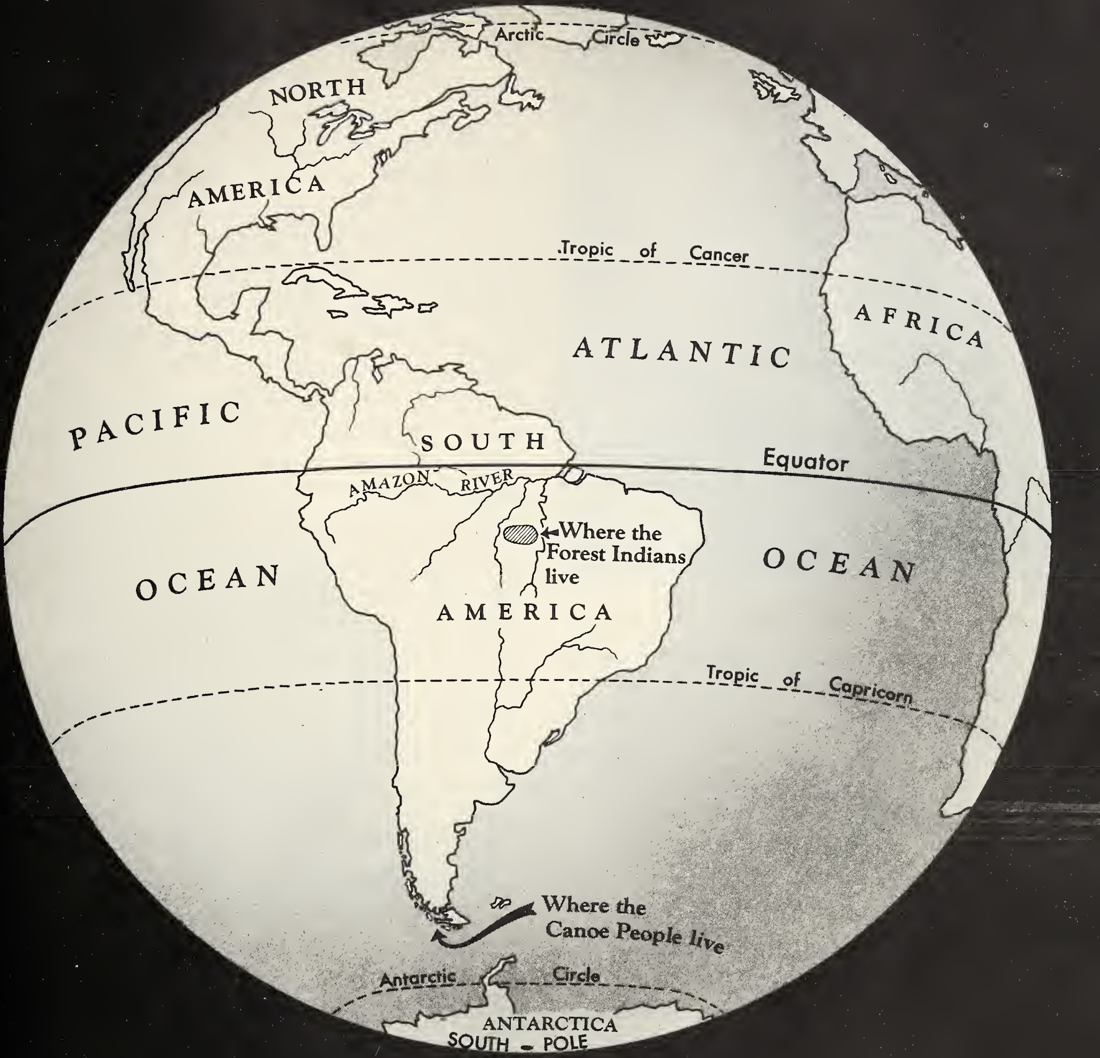
A great river. On this globe the large rivers are shown by crooked lines. Rivers are marked in this way on maps also. Find the Amazon River in South America. It is one of the three longest rivers in the world. Since many smaller rivers and streams flow into the Amazon, it carries a vast amount of water. It enters the ocean almost at the equator. Now find the place where the Forest Indians live. It is between two rivers that flow into the Amazon from the south. Notice that these Indians live a long distance north of Tierra del Fuego, where the Canoe People live.

A land of many rivers. Through the forest, many rivers and streams come rushing down from the higher land which lies to the south. These streams wind in and out through the dense forest like narrow ribbons of silver. They are on their way to the great Amazon River.

Traveling on the rivers. At many points along these streams the water flows very swiftly over big rocks and is very rough. These places are called *rapids*.

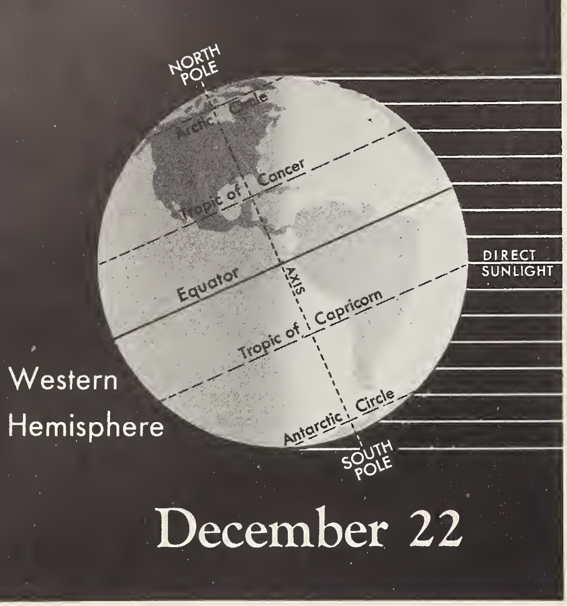
CHARLES PERRY WEIMER

These Indian children like to play in canoes just as you would. Notice how the dugout has been hollowed out on the inside. The Forest Indians are very skillful at making these long canoes.



There are also *waterfalls*, where the river falls over a shelf of rock. Rapids and waterfalls are dangerous for people traveling in a canoe. The Indians often carry their canoes around these places.

The Indians usually travel by water from one part of the forest to another. They go out on the water in dugout canoes. Some of these are forty feet long. The men seat themselves facing forward in the canoe. Then they force it ahead with strong wooden paddles. All the men dip their paddles into the water at the same time. When traveling through rapids, one Indian sits in the *bow*, or front part of the canoe, to steer it.



Sometimes the Indians make a bridge over a narrow stream. They cut down small trees and lay them from bank to bank. In some places the banks of the stream are so low that the tree trunks, curving downward under the weight of people crossing, are partly under water. In other places the banks are very high. Here the bridges are many feet above water. The Indians cross such bridges without fear.

Seasons in the southern hemisphere. South America lies mostly in the southern hemisphere. You know that when it is day in the western hemisphere, it is night in the eastern hemisphere. It is easy to see why. Half the globe on which we live is always in shadow when the other half is in sunlight. But there is a difference between the northern and the southern hemisphere too. When it is summer in one, it is winter in the other. In south Africa and Australia and in most of South America the shortest days come in June, the longest in December. The warmest weather is likely to come in January, the coldest in July. The seasons are turned upside down. The northern and southern summers come at opposite times of the year.

The tropics. The globe on this page shows the western hemisphere in December. Find the Arctic Circle and the Antarctic Circle on this globe. On which of these circles does the sun not set at this time of the year? Near which pole is the earth having winter cold and darkness?

Look at the small globe on the next page. What hemisphere does it show? It is now the month of June. Since December, the earth has traveled halfway around the sun. Now that it is June, the sun's rays come from the opposite direction. Which season is Antarctica having? Notice that while it is winter in Antarctica, it is summer in the Arctic regions.

Next find the circles named the *Tropic of Cancer* and the *Tropic of Capricorn.* Of course, on the real earth these lines are not marked. Which of these lines lies north of the equator? Which lies south of it? See whether these two circles are marked on your classroom globe.

Every year the sun seems to travel back and forth between the Tropic of Cancer and the Tropic of Capricorn. The sun does not really move, you know. Really, the earth is moving around the sun.

Look again at the first globe. On about December 22 the noontime sun is directly overhead at the Tropic of Capricorn. As the earth rotates, the sun's rays fall directly on the earth along that line. Summer is beginning in the southern hemisphere and winter in the northern hemisphere.

Look again at the second globe. The rays of the sun are falling directly on the earth at the Tropic of Cancer. On about

June 21 the noontime sun is directly overhead at this circle. Then the northern hemisphere begins its summer, and it is winter in the southern hemisphere.

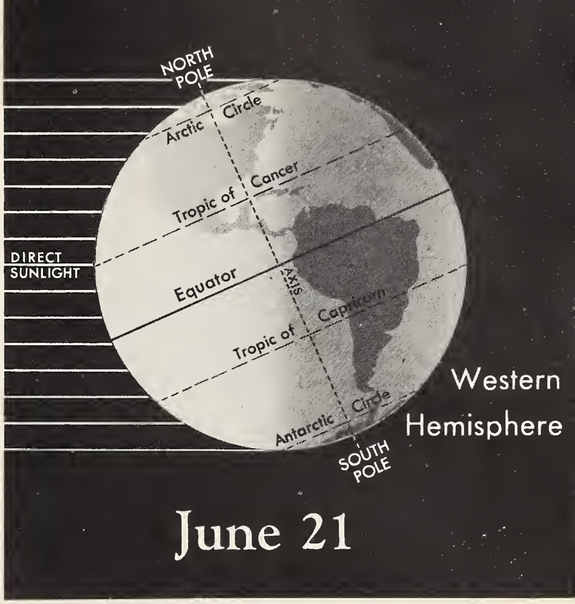
Between the Tropic of Cancer and the Tropic of Capricorn the noontime sun is directly overhead twice every year. It is overhead once as it moves southward and once again as it moves northward. We speak of the part of the world between these two circles as the *tropics*. In the tropics the noontime sun is always high in the sky.

Outside the tropics the sun is never right overhead. The rest of the earth gets only slanting rays from the sun. These rays do not warm the earth as much as direct rays do. Remember that the Tropic of Cancer and the Tropic of Capricorn mark off on our earth a broad band, thousands of miles wide, on both sides of the equator. Remember also that between these two circles the sun is directly overhead sometime during each year.

The Amazon forest which you have been reading about lies within the tropics. With the help of the map on page 75 perhaps you can tell whether it is nearer to the Tropic of Cancer or the Tropic of Capricorn.

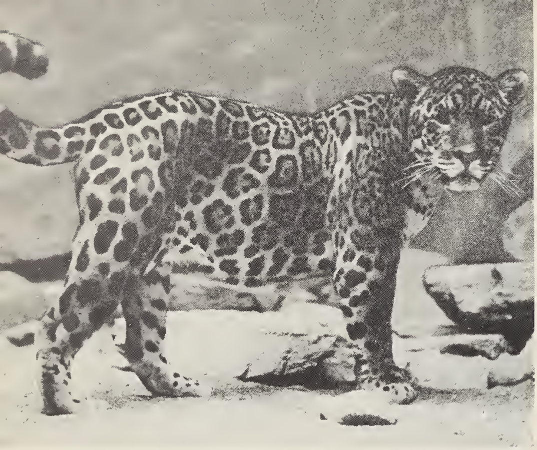
A tropical rain forest. Much of the land within the tropics receives a large amount of rain. Here dense forests can grow because there is so much rain and because the weather is always warm. We call these forests *tropical rain forests*.

The Amazon forest. The largest tropical rain forest in the world is the Amazon forest. Of course it does not extend all the way from the Tropic of Cancer to the Tropic of Capricorn. The Tropic of Cancer is north of South America. In South America the Tropic of Capricorn crosses deserts and grasslands as well as forests. The name, tropical rain forest, is given to all forests like this one, and most parts of such forests do lie within the tropics.



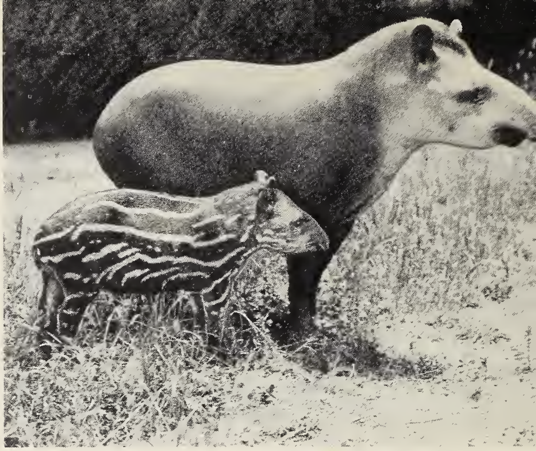
A dark, dense woodland. In some parts of the Amazon forest the trees grow so close together that the sun cannot shine on the ground. The branches of the trees meet and overlap the branches of other trees. The sun's rays reach the ground only along the banks of a stream or in a place where men have cut down the trees. In the dense parts of the forest there are no bushes at all. Not even grass can grow. The ground between the tree trunks is bare. In other parts where the trees are not so close together, bushes and shrubs grow. Vines cover them and climb up into the trees, making a thick tangle of leaves and branches. There are many different kinds of trees such as wild banana trees and nut trees. The branches of the trees are never bare. They have leaves all the year round.

It rains a great deal, and the air is



NEW YORK ZOOLOGICAL SOCIETY

The jaguar's fur is thin and not very useful to man. Can you tell why the fur is thin?



NEW YORK ZOOLOGICAL SOCIETY

The stripes on young tapirs make it hard for enemies to see them in the dense forest.

always damp. Because it rains often, the rivers do not dry up. Sometimes there is so much rain that the rivers rise and flood the land.

The sharp eyes of the Indians see beautifully colored birds flying about in the tree tops. These birds feed on the fruits of the trees. As fruits ripen in other parts of the forest, the birds move there. Chattering monkeys swing on trailing vines from tree to tree.

Spotted hunters. There are not many large animals in the Amazon forest. *Jaguars* with black spots on their yellow coats roam about looking for food. They eat birds, monkeys, and other animals. It is hard for a hunter to see the jaguars because the spots on their coats are like shadows of leaves on the ground. Jaguars are large cats with great heads, heavy bodies, and short thick legs. Besides the smaller animals, jaguars also hunt *tapirs*, which live in the deepest parts of the forest.

Other forest animals. The tapir, the largest of the animals in the Amazon forest, looks like a dark-brown pig, but is much larger. Its snout is much longer than a pig's. Young tapirs have light-colored stripes and spots. The Indians eat the meat of the tapir. It tastes somewhat like beef. Sometimes the Indians find tapirs at the places along the river where the animals come to drink.

Another animal that lives in the forest is the *peccary*. Peccaries look like small black pigs. Their flesh tastes much like pork. Peccaries travel in droves of thirty or more. Because of their sharp tusks they are feared by the Indians. Peccaries may make an Indian climb a tree and stay there for hours.

Though there are other animals in the Amazon forest, there are not so many as in the tropical rain forests of other countries. The Amazon forest has few large land animals. Large snakes crawl about on the branches of the trees, but there are not so many as there are in most rain forests.

Insects and insect catchers. Millions of *bats* fly through the forest at night. The body of a bat is somewhat like that of a mouse. It has strong wings made of slender bones covered by a thin skin. The skin of the wings is bare without fur.

H. ARMSTRONG ROBERTS

Alligators are ugly. But their hides can be made into fine leather and are very valuable.

EWING GALLOWAY

An anteater uses its strong forelegs to tear logs apart. It eats the ants it finds inside.

You may have seen bats darting through the air at night. Bats sleep in the daytime, hanging upside down in a dark place. They fly out at night to feed on insects.

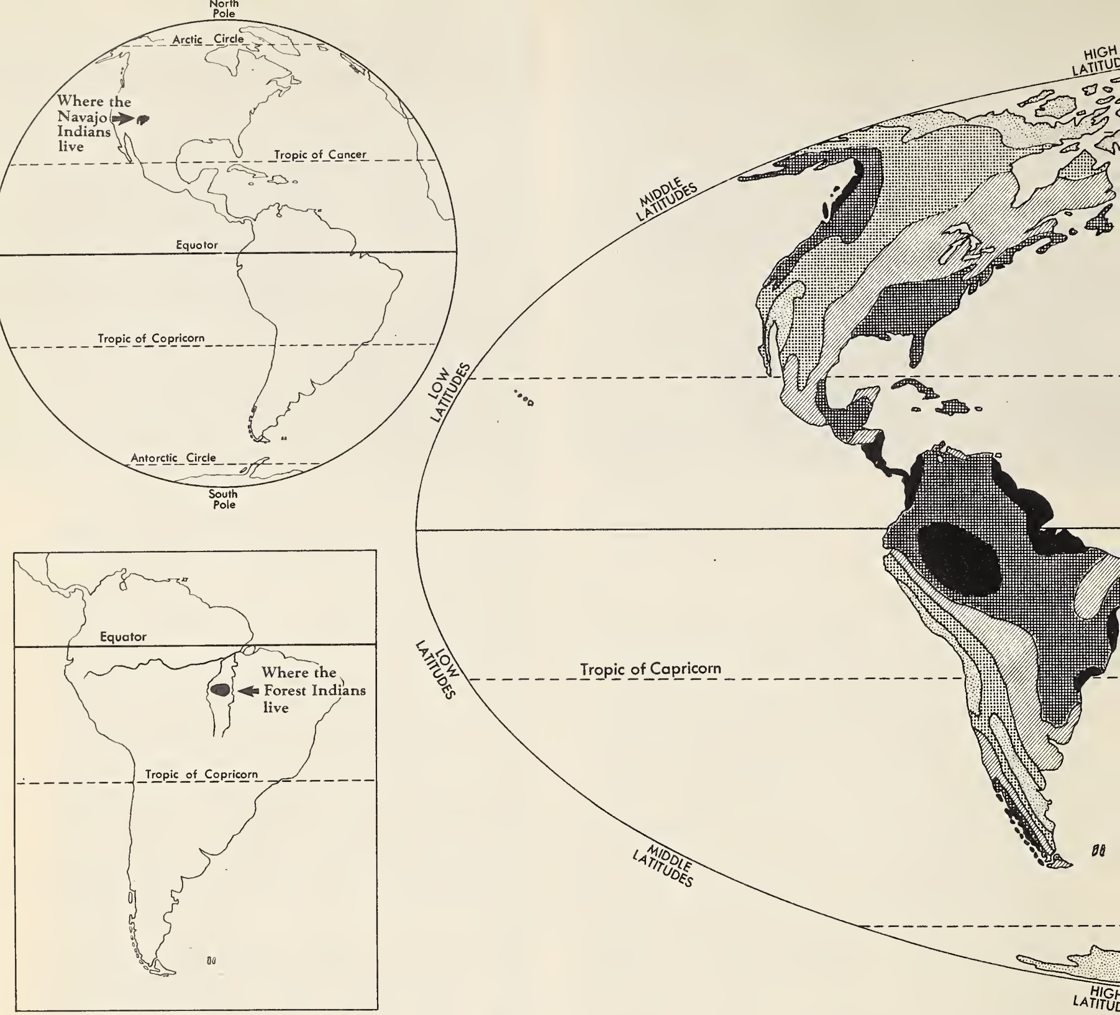
If you walked through this forest, you would see many insects flying about your head and crawling on the ground. Mosquitoes, flies, and gnats are found here where the ground is damp. There are also many kinds of ants, red, black, and white, that get into the Indians' food. But some of the animals that live in the forest eat ants. The animal called an *anteater* has a long snout. With its strong claws it can dig into an ant hill. Its long sticky tongue holds fast any ants that it touches.

The dry season. In our country we have four seasons during the year. But in the Amazon region, where the Forest Indians live, there are only two seasons. The dry season lasts from July to December. During this season the weather is not really dry. It is only less rainy than the rest of the year. In the Amazon region it does not get hotter or colder from one season to another. The weather is always warm and damp.

The rainy season. The rainy season lasts from January to June. In the early morning the day may be bright and clear. But later in the day clouds appear in the sky. A light breeze comes up, and then the air becomes still. Every afternoon there is a heavy downpour, and sometimes there is another late at night. There are many more rains than in the dry season. Sometimes there is thunder, and lightning flashes through the sky.

Perhaps you would like to know what causes clouds and rain. Warm moist air rising from the ocean blows in over the land. When the sun is shining, this air becomes very warm. Since warm air is light, it rises. As it rises, it gets cooler. The more it cools, the less moisture it can hold. Then tiny drops of water form. Thousands and thousands of these drops form a cloud. Then the tiny drops come together and make larger raindrops. When these drops fall to the earth, we say that it is raining.

A map showing rainfall. The map on pages 80 and 81 shows how much rain falls on the land surface of the world. It helps to explain why there are deserts in



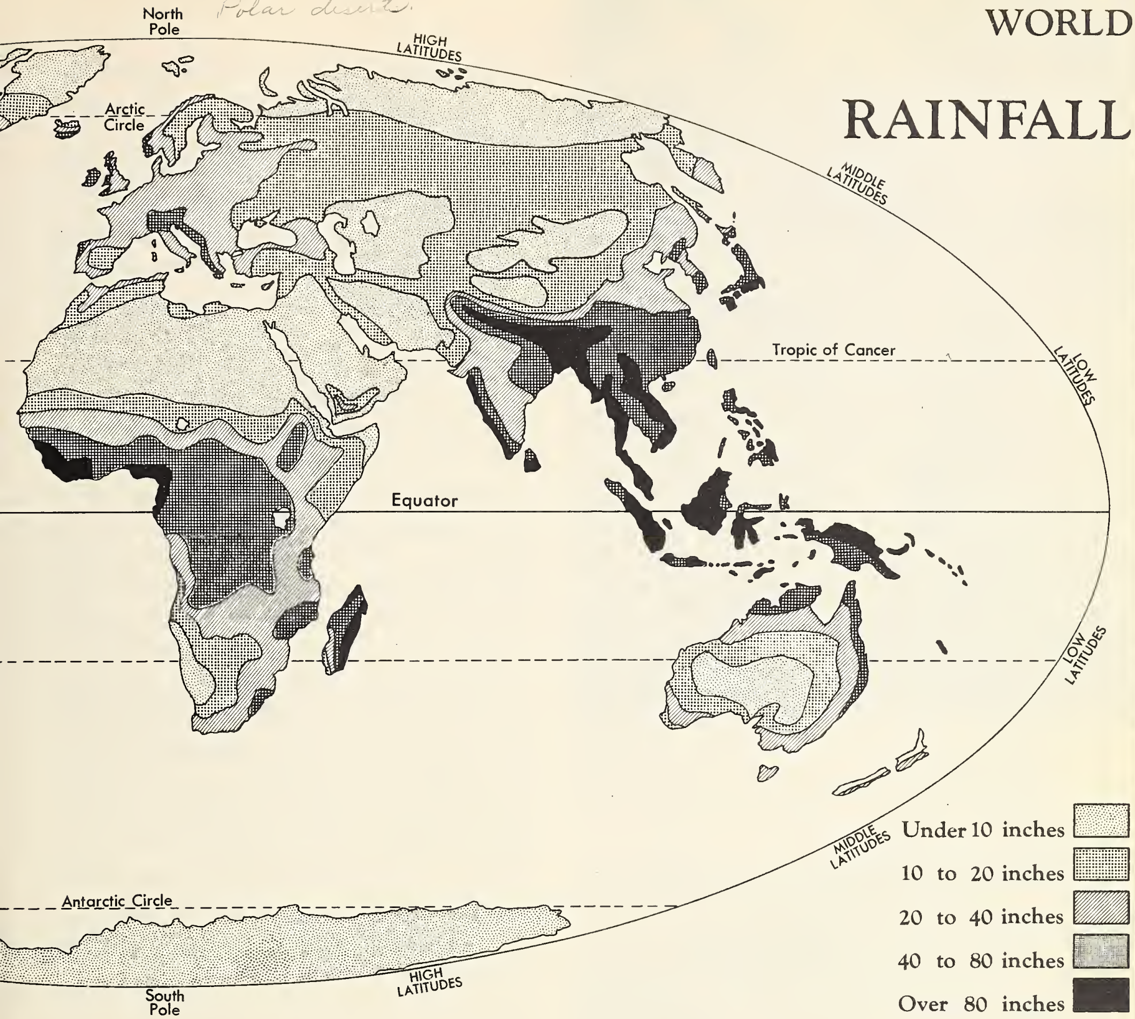
some regions and dense forests in others. The darkest areas of the map show the regions which get the most rain. The lightest areas get the least rain.

The amount of rain or snow that falls at any place in a year is called its *rainfall*. Have you ever left a tin can out during a rain and measured the water in it at the end of the storm? If the water in the can is an inch deep, you would know that an inch of rain has fallen. When the rain falls on a field, the water sinks into the ground or runs off in streams. If the ground were level and the water from an inch of rain did not soak in, the water would be an inch deep on the field.

Different rainfall in different places. This map shows you that there are parts of the world where the rainfall during a whole year is less than ten inches. You can see from the map that the western part of the Navajo country is such a region. Suppose that you used a tin can ten inches deep to measure the rainfall in such a region. Even if the water did not dry up, the rainfall for a whole year would not

WORLD

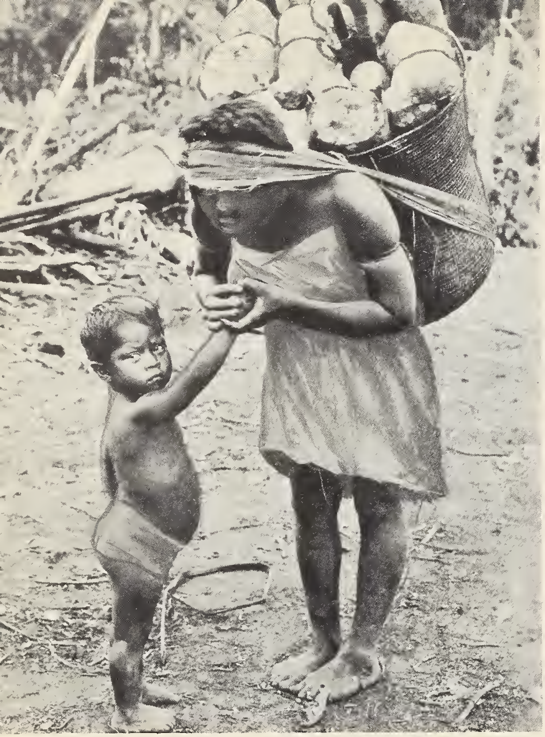
RAINFALL



fill the can. Places that receive less than ten inches of rainfall are mostly deserts. That amount of rain is not enough to keep even grass growing, except in cool lands where very little of the water evaporates.

Twenty inches of rain is enough for plant growth in most countries outside the tropics. In these countries the weather is cold during part of the year, and the land dries slowly. If most of the rain falls during the growing season, many crops can be raised. But in hot countries the land dries fast. There, twenty inches of rainfall is not enough for farming or even for growing plenty of grass.

From this map you can see that the region in which the Forest Indians live receives plenty of rain. It is one of the places in the world where there are from forty to eighty inches of rainfall in a year. Tierra del Fuego, about which you have read, also has heavy rainfall. Dense forests need plenty of moisture. All the forest regions in the tropics have a great deal of rain.



HAMILTON RICE EXPEDITION

The Indian woman stops her work to take a splinter from the finger of her little boy. Notice her great load of manioc roots.

HOW THE INDIANS GET THEIR FOOD

Some of the Forest Indians go into the forest to hunt monkeys, birds, jaguars, and other forest creatures. Sometimes game is so scarce that the men get little food by hunting. But at other times game is plentiful. Other Indians stay at the river to fish.

Clearing the land for crops. During the dry season the Indian men clear a plot of ground in the forest for a farm. They use a *machete*, which is a knife with a long blade. The Indians bought their machetes from traders who traveled up the river. With their machetes the men cut down the small trees and brush. They leave the large trees standing, for it would be hard to cut such trees. After some of the trees and the brush have been removed, the sun shines on the damp ground. The soil begins to dry out.

A little later the men go back to the cleared space. They set fire to all the plants left. The flames burn away the branches of some of the trees. Though these trees too are killed, their bare trunks still stand on the land. Next the men break up the earth with sticks and wooden clubs. After breaking up the soil, the Indians wait until the rainy season to plant their crops.

Planting crops. This work is done by the women. They take their babies along with them. The baby is carried in a cloth bag hanging at the mother's back. The women must have their hands free to work.

Growing manioc. The women plant *manioc*. They set little cuttings of the manioc plant in the ground. They do not plant in regular rows as we do. Instead they put the cuttings wherever they can find a clear space between tree stumps. They also plant yams, sweet potatoes, and fruits. But the manioc is the crop which the Indians use most. The roots are used to make bread.

Manioc must grow a long time before the roots are large enough to be used. After about a year and a half, it has big roots which are shaped like a potato. Then it is ready for harvest.

Whenever food is needed, the women dig up a few roots from among the weeds. The weeds grow fast after the land has been cleared, but the Indians do not try to keep weeds out of their farm. They do no more than partly clear the land, plant their crops, and gather them.

After all the manioc has been eaten, the Indians leave the clearing. Much of the plant food in the soil has been used up, and another crop would not grow well. The Indians do not fertilize the soil. There are few people living in the Amazon region, and there is plenty of land, so the men can clear new land for the next crop. Scattered here and there in the forest are places where the Indians once had farms. But it does not take long in this warm rainy region for vines and bushes and trees to grow there again.

Preparing the manioc. The Indian women take long baskets with them when they go out to dig up the manioc roots. After they have filled their baskets, they go to the river and wash the roots. Then the manioc is peeled. Some women peel the roots with their teeth. Others use knives made of hard wood.

The women rub the root on a grater to break the manioc into small pieces. The grater is a board into which small sharp stones have been pounded. An Indian woman bends over her grater and rubs the manioc up and down just as if she were washing clothes. The manioc breaks up into a soft wet pulp, and the juice comes out.

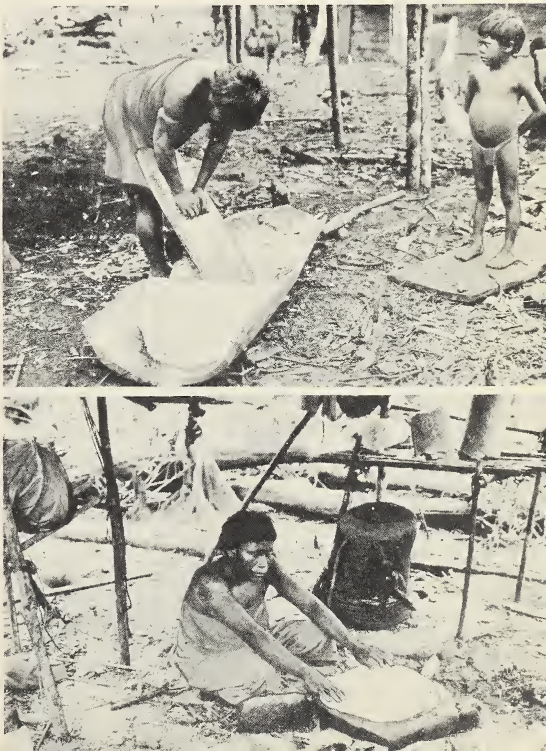
The Indians know that the juice of the kind of manioc that they grow is poison. The woman puts the pulp into a long tube made of bark. Then she soaks it in the river to wash out all the juice. After she has squeezed out the water, the pulp is allowed to dry. She breaks it up until there are no hard lumps. Then it is ready to be made into bread.

Making bread. The woman shapes the pulp into flat cakes. Then, while it is still fresh, it is baked in a clay oven over the fire.

Manioc bread made fresh every day is sweet and good. It would not taste so good if it were cold and dry. The women go almost every day to the field to dig manioc roots. And almost every day they prepare the pulp and bake bread.

Fishing. Many fish are found in the streams, and the Indians are skillful fishermen. Sometimes they build a fence around an area in the water near the bank, leaving an opening at one end. Then they dive into the water which is fenced off and catch the fish with small nets. They must beware of a small dangerous fish called a *piranha*. It has sharp teeth and is likely to take a bite out of an arm or leg. If an Indian pulls this fish out of the water, it will make a loud, grunting noise. No other kind of fish that lives in these rivers is harmful to people.

The Indians catch fish in other ways too. They make a cone-shaped basket out of *wicker*, or woven twigs. It is shaped



Preparing manioc. In the top picture an Indian woman is grating manioc roots. In the lower picture the woman is making the washed pulp into a large flat cake for baking.

HAMILTON RICE EXPEDITION

HAMILTON RICE EXPEDITION

An Indian drawing his bow. The bow is taller than he is and the arrow is very long.

like an ice-cream cone but is large enough to hold fish. Fish swim into the large open end but cannot get out at the small end. They cannot swim backwards, and there is not enough space for them to turn around. The wicker cone is placed in the water, the small end pointing *downstream.* Downstream means the direction toward which the water flows. *Upstream,* then, means against the flow, or toward the place where the stream begins. As the fish move downstream, some swim right into the cone and are caught. Near rapids, the Indians usually use nets.

The men take their fish back to camp. The women will boil some of the fish for supper. Other fish are placed on a small platform over the fire. There they will stay until they are dried or smoked. They will then keep a long time.

Hunting in the forest. When the Forest Indians hunt, two or three men go to the forest together. Each man hunts game for his own family. The hunters will kill monkeys, jaguars, tapirs, birds, and other forest creatures.

The men go quietly into the forest. They have sharp eyes and keen ears, and they can find forest creatures hidden among the trees. Their bows, made of hardwood, are taller than the men themselves. With their bows they shoot long arrows. When they shoot an animal, they watch it carefully so that they will know where to look for it when it falls.

What the Forest Indians eat. Manioc is the main food of the Indians. On some days they eat nothing else. But often they have other foods too. They eat fish that they catch in the streams. They like turtles, the tails of small alligators, game from the forest, and pineapples, bananas, sweet potatoes, and other crops which they raise. The tails of the alligators are cut into steaks and cooked over the fire.

The Indians use small red peppers too. When they have no fish, they make pepper soup by boiling peppers in water. Each person dips bread into this soup.

LIVING AND WORKING IN THE FOREST

Evening in an Indian house. In the evening the Indians return home. The women come from the farm carrying manioc, pineapples, and other foods in baskets. The hunters bring in the game which they have killed in the forest. The Indians who went fishing bring back the fish which they have caught.

The women begin to prepare the evening meal. There is very little talking. There is no clatter of dishes, for the plates are palm leaves from the forest.

When the meal is ready, the men help

themselves to the food in the pots over the fire. With their fingers they tear their food into small pieces and then eat it. At the end of their meal they drink large quantities of water.

Then the Indians gather around the fires and tell stories, often about the animals and birds that share the forest with them. After the last story the Indians go to bed in the hammocks hanging around the fires. When a fire dies down, someone rises and pushes the sticks of wood closer together. Then he goes back to his hammock and sleeps until about an hour before sunrise.

Making pottery. The women make their own clay pots for cooking. They find wet clay along the riverbank. Then sitting on the ground, they work the wet clay with their hands. When the clay is smooth and soft, they roll it between their strong hands into a long roll.

These rolls can be coiled around and around into the shape which a woman wants. Sometimes she digs a hole in the ground and fits the clay into that shape. She uses a piece of bone or wood to smooth the sides. When the bowl is shaped, she sets it in the sun to dry. Then she bakes the clay bowl in hot ashes. Afterwards she rubs it until it shines. Sometimes she paints her bowls red or black with juice from the bark of a tree.

Making baskets. The women also make the baskets which they use. They tear palm leaves into strips and weave the strips together. In the same way they make the hammocks in which the members of the family sleep.

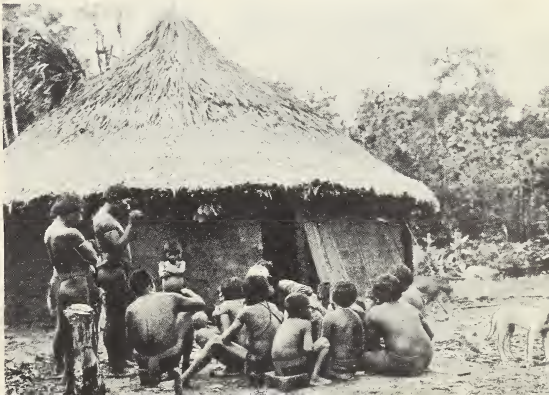
The women find all the materials which they use close at hand. They have few materials brought from distant places. They do not have bowls or beds or baskets that other people have made. They make nearly everything for themselves. Only when a trader comes up the river are they able to get machetes or a few other articles by trade.

Building a new home. The Forest Indians are nomadic farmers. While they are using the manioc from one plot, they clear and plant another. When the manioc in the first plot is gone, the second is ready to be harvested. They move to the second plot to live, and then clear and plant another plot for the next move. Farmers in our country farm the same land over and over again. But the Forest Indians move freely about in the forest and plant farms wherever they like.

When the Indians move, the men must build another house for the tribe. All their materials come from the forest.

First, the Indians set up a circle of posts in the ground. These posts, when covered, will be the wall of the house. Next the Indians get ready to make the roof. To hold up the roof, they use several long poles cut from young trees. They stand these poles at different points inside the circle, the highest pole in the center. The roof will slope downward on all sides from the center to the top of the wall. They make the roof of palm leaves placed so that they overlap like shingles. A roof made of leaves or grasses is called

Indians gather around a visiting trader outside their house. Notice the thatched roof.
HAMILTON RICE EXPEDITION



a *thatched* roof. After all the *thatch* has been put on, the roof is about fifteen inches thick. Rain will not go through it.

The circle of posts is also covered with thatched palm leaves to make the side walls. The builders tie the sides and the roof together, using vines as ropes. It is a large house. If the Indians have a feast, more than a hundred people may come inside.

The only heavy materials which the Forest Indians use in building their houses are the tree trunks which hold up the roof. For walls and roof they use light coverings which they find in the forest. Because they move often, they do not need a home which will last many years.

FARMING IN A SIMPLE WAY

The Forest Indians add to their food supply by hunting, fishing, and gathering nuts, fruits, and berries from wild trees and bushes growing in the forest. But they live chiefly by farming. They use the simplest way of farming in all the world. They clear small patches of land in the forest. Without cultivating the soil they plant their crops among the partly burned trees and stumps. They use only simple tools such as sharpened sticks and clubs made of wood. They have no plows, tractors, or other farm machines. After the planting is done, the Indians do not return to the fields until time to harvest the crops. They do not cut down the weeds that soon spring up among the plants. The Indians find it about as easy to clear a new place as to keep the same farm.

Inside the house. The Indians' hammocks are hung from the poles holding up the roof.

Because the Forest Indians have different ways of getting their living, they do not live as simply as the Canoe People. They do not depend as much on hunting as the Eskimos do. Most of the Forest tribes do not raise animals for food, as do the Reindeer People and the Navajo Indians. Yet the Forest Indians also have a steady supply of food.

Migratory farming. Like these other peoples the Forest Indians *migrate*, or move about. When the soil has little plant food left, they find new fields farther away from their house. At last they give up their house and build a new one where the land has not been farmed. Such farming is called *migratory farming*. It can be done only in regions where few people live and where there is much land that is not used.

You remember that you were told about subsistence farming. The Forest Indians have subsistence farms, from which they usually gain only a bare living. Occasionally a trader visits their part of the country. If they have some forest products, such as figs, nuts, or game, the Indians may offer these things to the trader. In return he lets them choose some tools, such as machetes, which he has for sale. But almost all of their living comes from their farms, from the river, or from the forest.

Working with Geography

See how long a list you can make of:

a. Animals that live in the Amazon forest. Before you list the name of an animal, be sure you can tell what it looks like. Look in your book to see how to spell its name.

b. Kinds of work that Forest Indian men do.

c. Kinds of work that Forest Indian women do.

READING MAPS AND GLOBES

1. Using a globe, show where the Forest Indians live. Show also the Navajo country.

2. When it is winter in the Navajo country, what season is it in Tierra del Fuego? If you were in Tierra del Fuego and wanted to reach the Amazon forest, in which direction would you go?

3. In what continent is the Amazon River? More water flows out to sea in this river than in any other river in the world. Show where the water enters the ocean. Tell in what general direction the river flows.

4. Is there a great deal of rain, or a medium amount of rain, or very little rain where you live? See what the rainfall map on page 80 shows about your part of the country.

5. From the map on page 80 tell how much rain falls in Greenland. In northeast Eurasia.

6. On a globe find the two circles called the Tropic of Cancer and the Tropic of Capricorn. Which of these is north of the equator? Remember that between these two circles the sun is right overhead twice during each year.

7. Find the Arctic Circle and the Antarctic Circle on your globe.

QUESTIONS ON THIS CHAPTER

1. How do the Forest Indians get their food?

2. Why do they move so often?

3. Do you think it would be pleasant work to make a farm in the Amazon tropical rain forest? Tell why you think as you do.

4. Of what do the Forest Indians build their houses?

5. In what ways are the Forest Indians like the Canoe People?

6. In what ways are the Forest Indians different from the Canoe People?

7. Do the Forest Indians farm in the ways used by farmers in our country? Show that you are right.

8. In this book find pictures of a region having much rain, another region having a medium amount of rain, and still another region having very little rain.

WORDS TO EXPLAIN

dry season
wet season
bow (of canoe)
steer (a canoe)
downstream
subsistence
rapids
waterfall
pulp
dense
thatch
upstream
manioc
migrate
rainfall
hammock
machete
tropical

EDWARD C. HUDOWALSKI

An airplane view of the eastern Sahara. In the distance you can see the great Nile River.

Farmers of the Nile Valley

In the northern part of the continent of Africa is a vast desert called the Sahara, which means "Great Desert." Only a little rain falls on the Sahara. Much of the land is sand and bare rock. Crops can be grown in a few small areas where water comes from springs or wells. But almost all of the Sahara is so dry that only a few tough plants can grow there.

In the eastern part of the Sahara is the country called Egypt. Here the Nile River flows in a shallow valley northward through the Sahara. The Nile brings to Egypt water from the rainy regions of Africa, where the river begins, or has its *source*.

Find Egypt on this map. The blue lines show the boundaries of Egypt. See the shallow valley of the Nile, winding through the desert. Now notice the land colored green on this map. It borders the river on both sides from southern Egypt to the sea. On this map the green color stands for cultivated land. This land is divided into many small fields. In these fields people work from daylight till dark.

You can see on the map that the Nile River empties into the Mediterranean Sea. You know that we often use the word *sea* to mean the whole ocean. But we also use the word *sea* in names of certain parts of the ocean. The part of the ocean between Europe and Africa is the Mediterranean Sea. What other sea is shown on this map? Between what continents does this sea lie?

A FARM VILLAGE

Many of the people of the Nile Valley live in farming villages. One of these villages is on the edge of the desert just west of the Nile. This small village is southeast of the town of Asyut near the bend in the river. On the map find the tiny circle which stands for Asyut. The farming village is too small to be seen on this map.

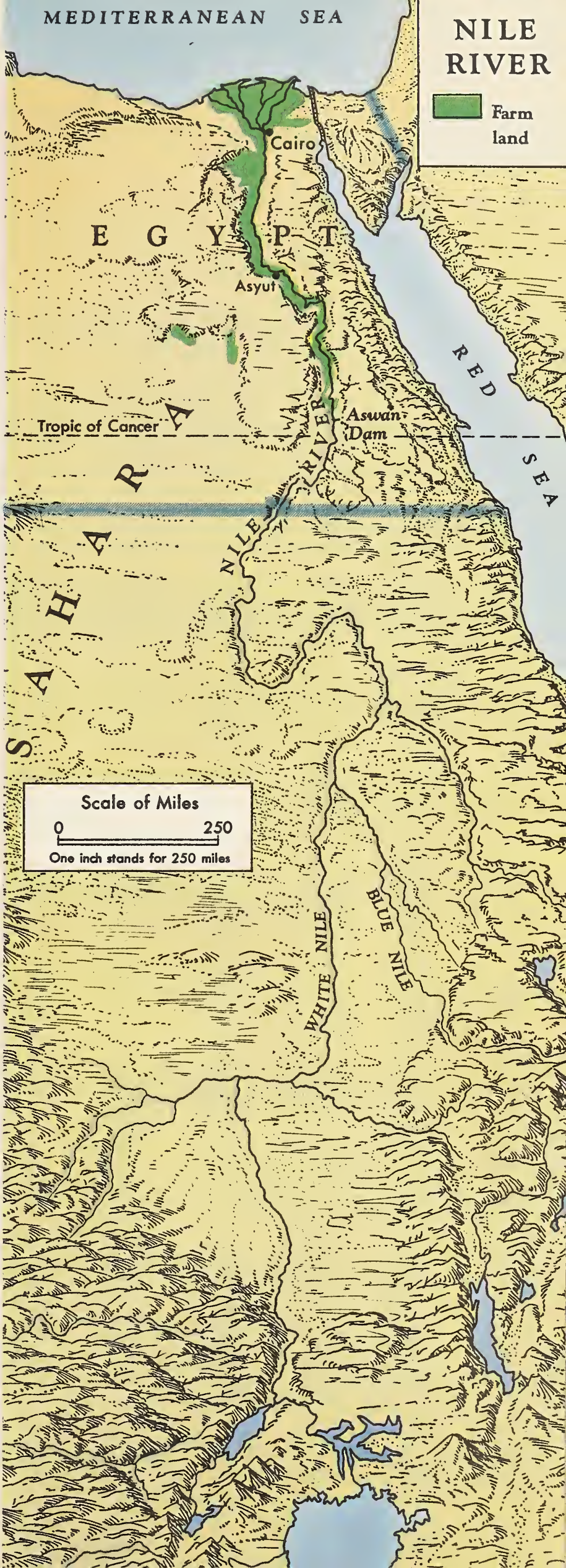
It is early morning. A farmer is starting out on foot to his fields. There are no clouds in the sky. Though it was chilly during the night, the air is growing warmer and warmer.

The farmer is strong-looking and has light-brown skin. He wears short cotton trousers, a long blue shirt with low neck and full sleeves, and a small cap. His feet are bare. He is carrying his lunch and tools.

The narrow path leading to the fields is crowded with people and animals. Most of the people of the village are going to work in the fields. Some walk as the farmer does. Others ride donkeys. Only a few old people and children have stayed at home.

As each family reaches its field, the path becomes less crowded. Since it will get hot toward noon, as the sun shines more directly on Egypt, the farmer takes off some of his clothes.

The farms in the Nile Valley are not at all like those you see in the United States. There are no fences or barns. So many people live crowded together in the Nile Valley that most farmers cultivate only a small amount of land. A field is not usually owned by the farmer who cultivates it. He either rents the field or works for the owner. The small farm is divided into long narrow strips by ditches



which bring water to the field. The neighboring farms are also small and are crossed by irrigation ditches. But today the ground is dry, for there is no water in the ditches.

Harvesting wheat. The Nile farmer is ready to gather his wheat. It was planted last fall and is called a winter crop. Now it is spring, and the wheat plants are full-grown. Each tall golden yellow stalk has a head containing many little *kernels*, or grains. The farmer will gather these stalks and take the kernels from the heads. He will make flour from the grain.

It would take too long to go through the fields and pick the kernels from their stalks. So he cuts down the stalks with a *sickle*. A sickle is a knife with a long blade shaped like the letter C. The sharp edge is on the inside.

He gathers the stalks into heaps. Then he ties each heap into a bundle with pieces of twisted straw. In many wheat regions a machine is used which cuts the stalks of wheat and ties them in bundles. But this Egyptian farmer has only a small field and is too poor to own such a machine. He uses only a few simple tools.

In the neighboring fields men, women, and children are working. There is a grove of palm trees near by. Some of the trees are date palms. These grow only in hot dry lands, but there must be plenty of water that the roots can reach. Dates grow in bunches on these trees. A man on a platform high up under the leaves is picking the ripe dates, which he will sell.

At noon all the people stop work. The farmer stops gathering his wheat and eats a little bread which he brought with him. Then with his sickle lying beside him he stretches out on the ground and goes to sleep. Now and then he lifts his arm to drive the flies away. There is the hum of insects in the field, but there is no other sound. All the other people are sleeping too. Even the donkeys in some of the fields have stretched out on the ground and gone to sleep.

Later in the afternoon the men, women, and children go on with their work. By evening the farmer has cut all his grain.

The farmer's wife brings his donkey to the field. The woman is dressed in coarse, black garments and has a black shawl over her head. She piles the bundles of grain on the donkey. Then she leads the

Egyptian boys are very proud of their donkeys and always take good care of them.

FRITZ HENLE

Threshing grain. This cart is drawn by oxen. The fork is used to separate grain from chaff.

EWING GALLOWAY

EWING GALLOWAY

All over the world people plow the land to raise crops. Beyond this farmer are the village and groves of palm trees. Notice the line of camels between the farmer and the village.

animal to the place where the bundles are to be left. The grain is laid on smooth hard ground not far from the field. Then the farmer starts back to the village with his wife and children and the donkey.

Threshing the wheat. The next day the farmer *threshes* his wheat. He puts thick layers of wheat stalks down on the hard ground. Then he climbs into a wooden cart and drives his donkey over the grain. The wheels move over the stalks and break open the *husks*, or outer coverings of the kernels. Then the grains fall away from the husks. Separating the kernels from the stalks and husks is called *threshing* the grain.

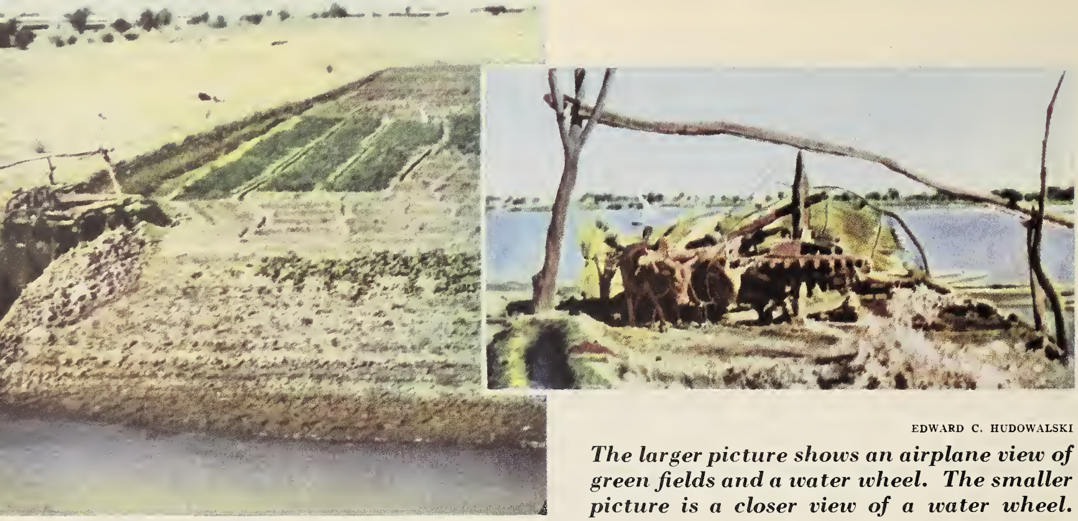
After the wheat has been threshed, the farmer throws it into the air with a long wooden fork. The grain, which is heavy, falls straight to the ground. The *chaff*, or fine straw, is blown to one side.

When the kernels of wheat have been gathered in a pile on the threshing ground, the farmer covers them with palm leaves. Later he will take the grain to his house in the village. There it will be stored in tall jars until he wishes to use it.

Planting cotton. In Egypt there is no cold weather. For this reason the farmer about whom you have been reading raises three crops a year in his field. Wheat is raised in the winter. Cotton is raised in the summer. Corn is raised in the fall.

For hundreds of years cotton and wheat have been grown in Egypt. The grain which we call corn was first raised on our side of the ocean and was later taken to Egypt.

After the farmer has harvested his wheat, he gets his field ready to plant cotton. With a simple wooden plow drawn by two oxen he cultivates the ground. He walks behind the oxen,



EDWARD C. HUDOWALSKI

The larger picture shows an airplane view of green fields and a water wheel. The smaller picture is a closer view of a water wheel.

guiding the plow so that the sharp steel point will cut into the topsoil. The plow cuts furrows in the field and turns the soil up, making a ridge on each side of the furrow.

Not much seed is needed to plant this small field. The quantity of seed which would fill a bushel basket is enough for the entire farm. The farmer drops the seed by hand and covers it with soil.

Watering the fields. In the summer the weather is very hot. Almost every week the farmer lets water into the irrigation ditches. Most of the water comes from large canals that lead off from the Nile River just below the Aswan Dam. Find this dam on the map on page 89. Below the dam means downstream from the dam. Above means upstream. Since this river flows northward, below the dam also means north of the dam. When many farmers need water to irrigate their fields, the water is let out of the lake above the dam by opening gates in the lower part of it. The large canals lead to smaller canals and then to ditches like those on the farmer's field. The ditches fill and bring water to the field. It runs between the rows where the cotton plants are growing. The weather is so hot in this land that the plants need much water.

Lifting water from the Nile. In some fields the farmers have water wheels to lift water from the river to the ditches in their land. You can see such a wheel in this picture. Oxen are used here, but donkeys are often used instead. The animals are driven round and round to turn the wheel. As it turns, the wheel creaks and groans, but water flows into the ditch. All along the Nile such water wheels are turning.

Sometimes a *shadoof* is used to raise water from the Nile or from a well. As you may see in the next picture, a shadoof has a bucket on one end. A weight is on the other. The bucket is let down into the water and is filled. Then as the weight lifts the bucket up, the workman guides it to a trough and empties it. The trough carries the water to the field.

There are easy ways to lift water to keep the fields green. Some farmers have been able to buy pumps that are run by electricity or gasoline. But many Egyptian farmers are too poor to buy a pump. They continue to use the methods their fathers used before them.

Caring for the cotton plants. When the cotton plants appear above the ground, the farmer's wife takes out some of them so that each small plant will have plenty of space in which to grow. If the plants are crowded, they will not have many blossoms. As the cotton plants grow, the woman and her children pull up all the weeds.

While the cotton bush is still small, flowers appear on the branches. After the flower has dropped its petals, it grows into a seed pod called a cotton *boll*. The bolls can be seen easily because the plant has few leaves. The green boll grows larger and larger as the cotton fibers grow inside it.

All this time the woman and her children have kept hoeing the weeds and breaking up the soil so that the young cotton plants can grow. She and other workers have killed the worms which eat the cotton bolls. If they are not killed, the farmer will not have a good cotton crop.

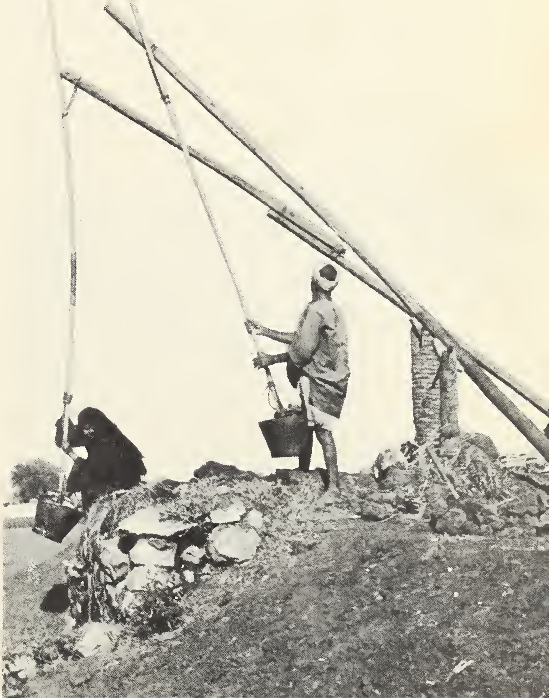
Raising other crops. Not every field is planted in cotton. Some farmers raise *sugar cane*, the plant from which most of the world's sugar comes. Cane must be watered even more often than cotton. Egyptian farmers also raise *millet*, rice, and fruit in summer and corn and millet during the fall. Millet is a grain that is much used for food in parts of the eastern hemisphere. In winter, beans, barley, and clover are raised as well as wheat. The farmers use the clover to feed their animals. They know just how often each kind of plant must be watered.

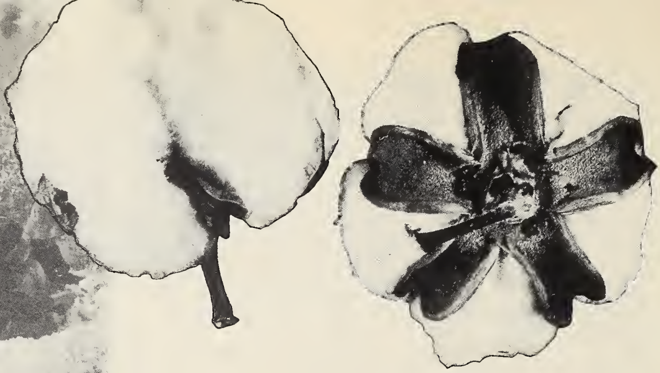
Picking and selling cotton. By September the green cotton boll has turned brown. The ripe boll bursts, showing the white fluffy cotton. Picking time has come. The farmer's children do most of the picking. The boys go into the fields in their long blue shirts, short white trousers, and tight little caps. The little girl wears a long plain dress of dark cotton with long sleeves. She has a cloth over her head to protect her from the sun. All the children are barefoot.

After all the ripe cotton has been picked, the farmer irrigates his land again. Next month more cotton will ripen, and the children will go up and down the rows again. They will have to pick cotton twice again before they have gathered all of it. But that which ripens earliest is usually the best. The fibers are long and fine and will be used to make cotton goods of the best quality.

Two shadoofs. The weight on the end of the pole makes it easier to lift a bucket full of water from the ditch below to the field above. Today shadoofs are becoming fewer and fewer. Modern pumps run by electricity or gasoline are taking their place.

J. ALLAN CASH FROM EUROPEAN





MEPA FROM EUROPEAN, AND EWING GALLOWAY

Many Egyptians do not own their farms. Instead they work for landowners. This landowner is pleased with the fine cotton crop. Look at the two bunches of cotton. See how the boll has split into five fingers.

The farmer's wife picks out many of the leaves and the broken husks left on the cotton. Then she puts the cotton into large bags. It is now ready to be loaded on the farmer's donkey and taken to the village to be sold.

The woman places the heavy bag of cotton on the donkey's back and leads the animal toward the village. The bag covers the donkey's back so that only its head and its short little legs can be seen. When the donkey reaches the village, the bag of cotton is unloaded in the yard near the farmer's house.

Soon a merchant who buys cotton comes to the village. He carefully looks at the cotton to see how long and fine the fibers are. He decides to buy it and pays the price for which such cotton is selling that day. After the cotton has been sold, the buyer and his helpers stuff it into sacks and place them on his donkeys. The farmer and his wife and children watch the buyer leave. The farmer holds in his hands the money which he received for his crop. After he has paid all his debts, he will have little money left. This Egyptian farmer and his family are poor.

Fertilizer for the fields. The farmers of Egypt must use a great deal of fertilizer on their fields, because they grow three crops a year on the same land. The farmers cannot afford to buy fertilizer for all crops. They can buy it only for crops like cotton that bring a good price.

The men get fertilizer for their other crops in some other way. In the village there is a high mud tower with holes all around the sides through which pigeons can enter. Hundreds of pigeons live in this tower. The farmers use the pigeon manure as well as manure from other animals to fertilize their fields.

Water for the farmers' homes. Some of the Egyptian villages lie in the midst of the fields, but others are on the edge of the desert. In these desert villages the people get water from the river, the canals, or wells. Water can be reached anywhere in the Nile Valley by digging down a few feet. Palm trees usually grow around these wells.

When the farmer and his family need water, the woman goes to the well to fill her jar. She carries it to her house on her head, standing so straight as she walks that the jar does not fall off. Although she has filled the jar almost to the top, she does not lose a drop of water.

The farmers have to depend on the Nile River for water for their crops because they live in a land where it seldom rains. Years may pass without rain, and then a hard rain may come that lasts for several hours. It may rain so hard that the roofs of the farmers' houses begin to leak badly. Then the roofs have to be built over again after the rain.

Village homes. The village is a cluster of mud huts along a narrow road. The walls of the farmer's house are of mud bricks the same color as the ground. The farmer's wife kneaded mud by hand to make them. There are a few holes in the walls for windows. The roof is of thatch made from palm leaves. Nothing grows in the dusty yard except a few weeds. Chickens peck among the weeds for food, and a donkey is tied near by.

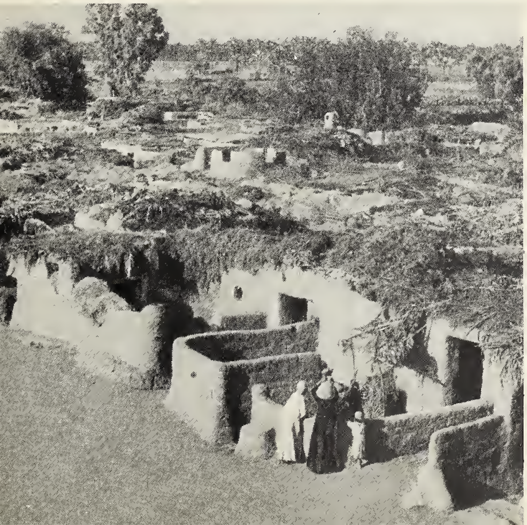
The other huts in the village look like that of this farmer. They too are made of mud bricks. Some of the houses have no roofs. Since this region has no trees that are good for lumber, the people have very little wood. They save what they have to make plows and water wheels, though today many of the water wheels are made of metal.

The farmer's house has only one small room. There is little furniture in the house. At the back of this room is a low bed covered with mats made of palm leaves. The parents sleep on this bed. The children sleep on the floor. In hot weather everyone sleeps outside. A few copper pots, wooden dishes, and some jars make up the kitchen ware. There are spoons but no forks. When a fire is built for cooking, the room is smoky, for there is no chimney.

The evening meal. In the evening the woman prepares a hot meal for her family. She has made coarse bread out of pounded corn. Everyone sits on the floor during the meal. Each person breaks a piece of bread and dips it into a pot of

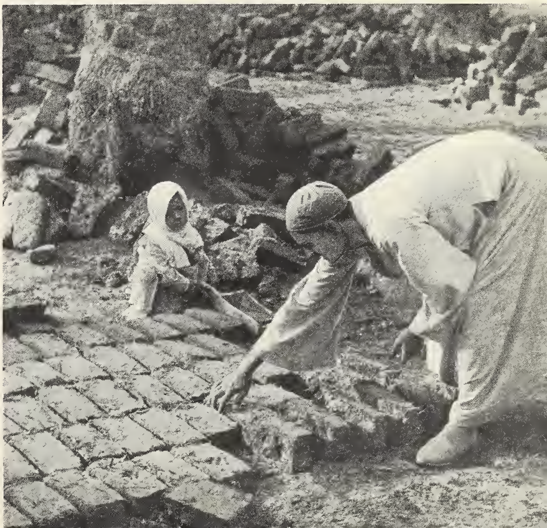
An Egyptian village. The houses have mud walls and roofs of thatch. Notice the woman carrying the water jar on her head.

J. ALLAN CASH FROM EUROPEAN



Making bricks. Mud is mixed with straw and shaped in a mold. Then the bricks are dried in the sun. The child is holding a mold.

J. ALLAN CASH FROM EUROPEAN



stew. The stew is made of beans cooked with peppers and onions. Onions are eaten at every meal, sometimes raw and sometimes cooked.

The bread is not always made of corn. The farmer's wife may use wheat or millet flour, which she bakes in thick cakes. Since these people are poor, they seldom have meat.

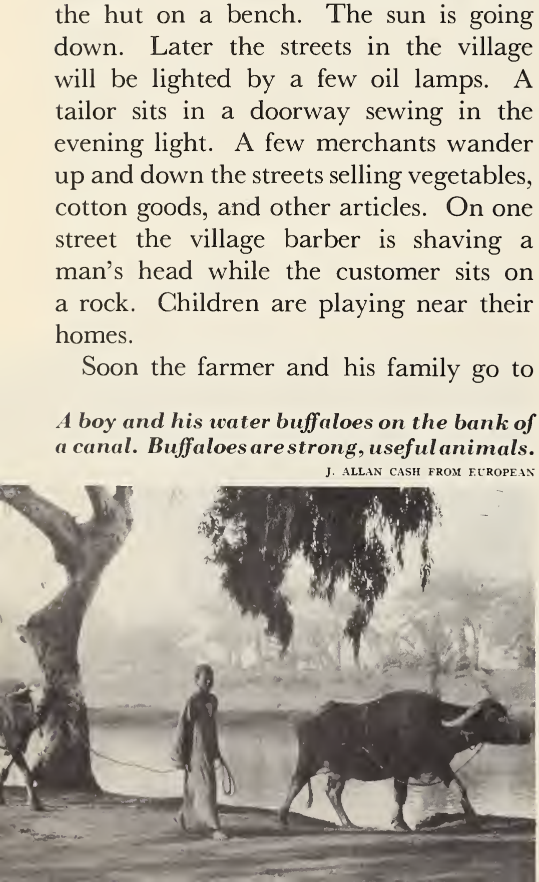
Earlier in the evening this farmer's wife milked her buffalo cow so that the family could have milk for supper. The black water buffalo is larger than an ox and has curving horns. It lives in wet places where it can wallow in the mud or lie in the water. Some farmers use water buffaloes to pull their plows. Most of these people like to drink buffalo milk, since it is good food.

After the meal the farmer sits outside the hut on a bench. The sun is going down. Later the streets in the village will be lighted by a few oil lamps. A tailor sits in a doorway sewing in the evening light. A few merchants wander up and down the streets selling vegetables, cotton goods, and other articles. On one street the village barber is shaving a man's head while the customer sits on a rock. Children are playing near their homes.

Soon the farmer and his family go to bed. They wear the same clothes at night that they wear in the daytime.

A boy and his water buffaloes on the bank of a canal. Buffaloes are strong, useful animals.

J. ALLAN CASH FROM EUROPEAN



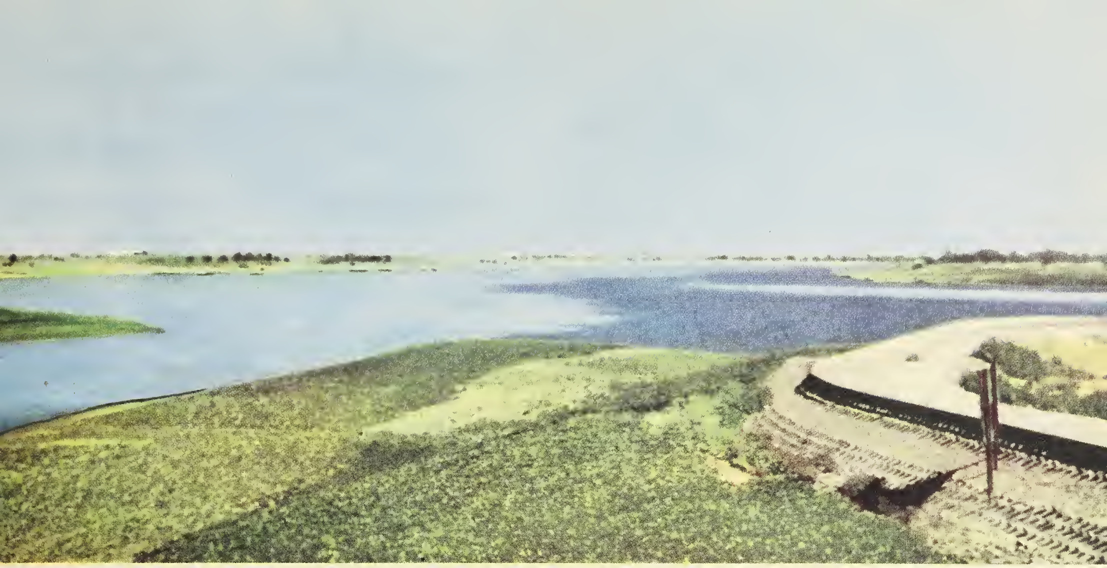
Out in the fields huge bats fly about. They are called fruit bats because they live on fruit. A bird called a *heron* flaps its wings and flies towards the river. It has a long neck and legs and a long bill with a sharp point. A fox comes down from the desert hills to the water. In the darkness by a fire sits a watchman. He will be alone in the fields until dawn. He pulls his coat about his shoulders, for the evening air is cool.

Making jars. In this Nile village there is a man who makes beautiful jars out of clay. He is called the *potter*. His father taught him to use the *potter's wheel* and to make many kinds of jars which Egyptians use. The potter sells the jars in which the village women carry water from the well or from the Nile River. His shop is filled with jars that he has made. They are of many sizes and shapes.

Under a palm tree the potter's wife gets the soft clay ready. She mixes it with water and kneads it by walking on it until it is soft and smooth.

Inside his shop the potter sits at a flat wheel which he turns with his feet. He puts a handful of wet clay on the wheel. As the clay turns in front of him, he smooths it and shapes it like a jar. After he has shaped a clay jar, he dries it in the sun. The dry jars are sent to a town not far away to be baked.

The potter does not put much decoration on his jars. He thinks mostly of their usefulness in carrying water. He may twist a rope around the larger jars just above the middle. The rope helps to keep the jar in shape as it dries. Just before he sends the jar to be baked, he takes off the rope. The marks of the rope make a design on the jar.



EDWARD C. HUDOWALSKI

Where the Blue Nile and the White Nile join. You can see how these rivers got their names.

THE NILE RIVER

The water that people use in the Nile Valley comes from mountain lands far away to the south. Lake Victoria is hundreds of miles south of the Sahara in a region of heavy rainfall. The main branch of the Nile River flows out of Lake Victoria. This main branch, called the White Nile, starts northward as a small stream. But as it flows along toward the Sahara, it is joined by other streams and becomes larger.

On the map on page 89 find the high mountains southeast of the Sahara. In late summer or early fall heavy rains come in these mountains. The water rushes noisily down between the steep slopes into several streams. One of these is the Blue Nile.

This stream carries its water to the White Nile. Find the place on the map where the Blue Nile joins the White Nile. The joining of these and the other streams adds more and more water to the Nile. All the time, of course, the Nile is flowing down to lower land. Rivers, you know, always flow downward.

While the Nile River is passing through the desert, no other streams flow into it since no streams begin there. You will not find many rivers in a desert, for rivers come from rain or snow, and deserts do not have much of either. As the Nile flows along, some of its water is lost by evaporation, and some sinks into the ground. Therefore the Nile gets smaller. But it carries so much water that it never dries up.

The delta of the Nile. At the mouth of the Nile is a fan-shaped plain on which the stream divides into many parts. Here rich, low, level land has been built up by the mud carried down by the river. Such a fan-shaped plain at a river mouth is called a *delta*. Find the delta of the Nile on the map on page 89. Mud is still being carried by the river, and the delta is still slowly building. Most of the cotton fields of Egypt are on the delta of the Nile, but not those about which you read earlier in this chapter.

Irrigation waters. For thousands of years the farmers along the Nile have grown crops on land watered by the Nile. In the autumn when the river was full, the waters rushed down from the mountains and soon came to the low land where the farmers lived. More and more water came into the river, and the river rose higher and higher. The water spread out over the fields on both sides of the river in a flood. It stood on the land for many days, and some of it sank into the ground. Several weeks after the flood waters had gone down, the water remaining on the fields was drained back into the Nile. A thin layer of rich mud was left on the land. This mud was made up of tiny pieces of earth and sand brought down from the mountains. It was good rich earth that would make crops grow well. This new soil helped the farmers to grow good crops the rest of the year.

The farmers therefore depended for water on the rise of the river. When there was heavy rainfall near the source of the river, the low land along the river was flooded. Large areas were covered with water. As soon as the water had drained away, crops were planted. They grew well because the soil was wet. Large crops were raised. The people had all the food they could use and even some to store away. But when the rains were light, much of the land was not flooded. Crops were very poor. In such years the people did not have as much food as they needed. Sometimes they had barely enough food to keep them alive.

The Aswan Dam. Flood waters are stored behind the dam for use in the dry season.
BRITISH COMBINE

Much of the flood water flowed on to the sea and could not be saved. After the flood water drained off the fields, much of the land had no more water until the next year. Therefore the farmers could grow only one crop each year, even in the years of heavy rainfall.

The Aswan Dam. In 1902 men finished a dam to hold back the flood waters of the Nile and called it the Aswan Dam. On the map on page 89 find this dam near the place where the river crosses the Tropic of Cancer. The builders of the dam wanted to store up the flood water so that the farmers might have plenty of water all the year round.

Now the Nile no longer overflows its banks. The water stored behind the dam makes a large lake. The water is let out as needed to irrigate the fields at all seasons of the year. Today land that was once desert is irrigated. More people can have farms. The fields can have water when the crops need it. The farmers can grow enough food to live. Often they can grow enough food so that they can sell some of it to other people. But because the land is no longer flooded, the fields do not receive the rich new soil that the floods used to bring. Now the farmers must use fertilizer on their fields.

Olden times along the Nile. The land that is covered with water when a river overflows its banks is called a *flood plain*. For thousands of years people lived on the fertile flood plain of the Nile. They had learned to get along together and share the use of the water from the Nile, and they had made good laws to govern their ways of living. The people along the Nile had to live by fair laws so that all might be able to use the rich fields along the river. If they had not lived by fair laws, some of them could not have raised enough food to keep alive. So the Egyptians lived very differently from the savage people of those days.

The pyramids. There are a great many wonderful old buildings along the Nile River which these people of olden times built. Many of the buildings have been standing for four or five thousand years.

By far the most famous of these old buildings are the *pyramids*. These great heaps of stone blocks were built by thousands and thousands of workers. It took many years to build each pyramid. The kings of Egypt used the pyramids for tombs. When a king died, his body was carefully preserved and wrapped in fine linen. It was then placed inside the pyramid tomb.

More stone is used in one of the pyramids than in a whole block of tall office buildings today. Some of the *mummies*, or preserved bodies, of the kings and members of their families may now be seen in our museums.

CAIRO

One of the oldest cities in the world, Cairo, stands where the fertile fields along the Nile begin to widen out and form the delta. The name of Cairo is printed on the map on page 89, and a little circle shows where the city is. It is the largest city in all Africa, having more than a million people. Travelers reach the city by coming overland or by boat on the Nile. Here travelers return from the desert or start out on a desert journey. In the old part of Cairo one can see the towers of some of the churches that are called *mosques*. Since many of the people of Egypt are very poor, you would find beggars there too. In the new part of the city, however, there are wide streets, large stores, modern buildings, and busy factories. Goods from Europe are brought into Cairo, and things made in its factories are shipped to other countries.

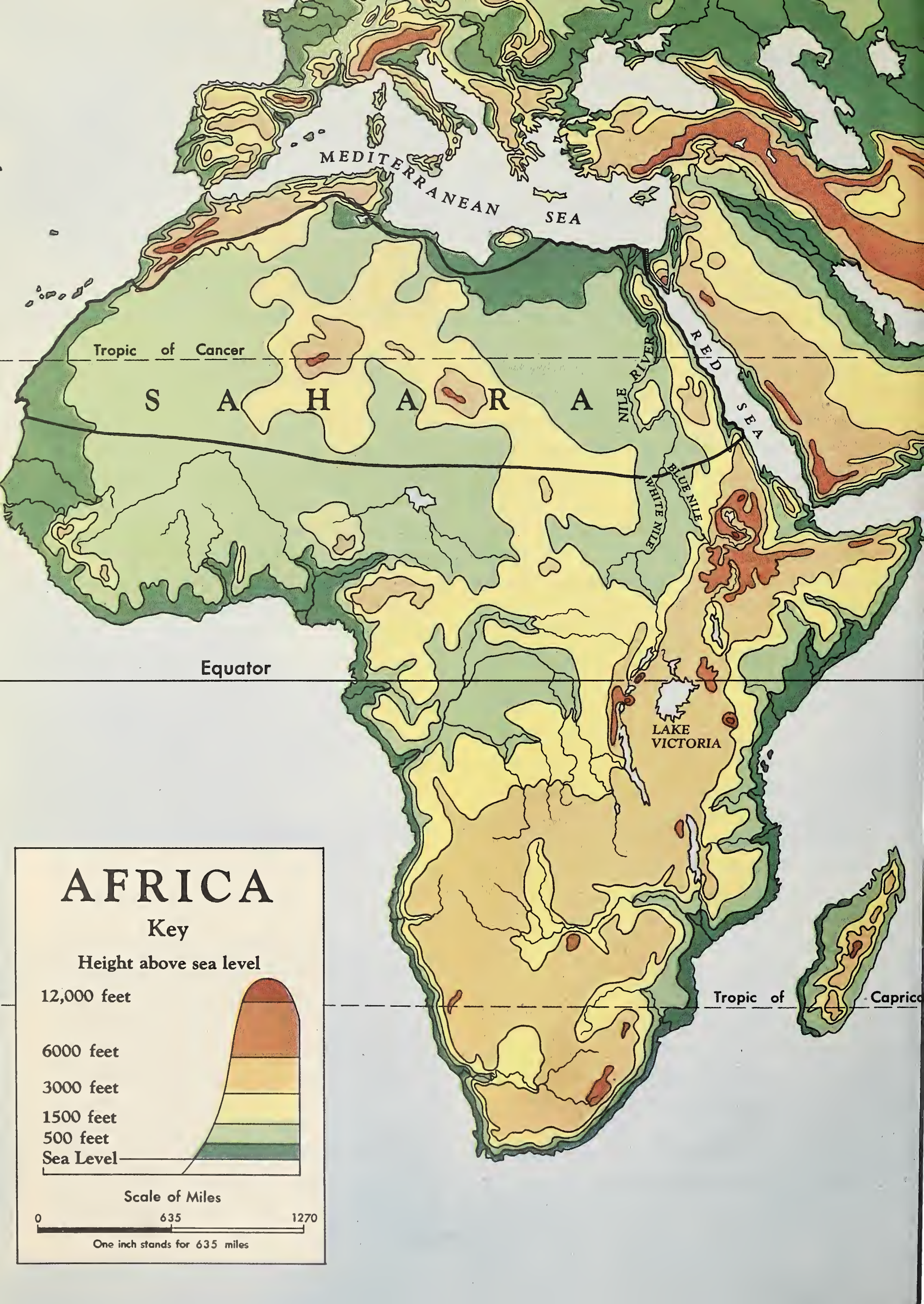
EWING GALLOWAY

Two pyramids. The village is built on the river bank. The water is shallow near shore.

HEIGHT OF THE LAND

The map on page 100 is a map of Africa. The colors on this map show how high the land is above sea level. Find the key on this map. It shows you the height of land for which each color stands. Which color stands for the lowest land of all? Which color means the highest land?

When you know the height of the land in a region, you can tell the directions in which rivers flow. They always flow from highland to lowland. This map tells you the height of the land along the


MEDITERRANEAN SEA
Tropic of Cancer
SAHARA
NILE RIVER
RED SEA
BLUE NILE
WHITE NILE
Equator
LAKE VICTORIA
Tropic of Caprico
AFRICA
Key
Height above sea level
12,000 feet
6000 feet
3000 feet
1500 feet
500 feet
Sea Level
Scale of Miles
0
635
1270
One inch stands for 635 miles

entire length of the Nile. You remember that the Nile flows northward from its source to the Mediterranean Sea.

Find the White Nile on this map. Locate the source of the White Nile. You can see that the source is in the highlands. Now find the source of the Blue Nile. Here too there are highlands. Now follow the Nile River all the way north to the Mediterranean Sea. Why does the Nile River flow north?

Some of the rivers of the world flow northward as the Nile does, because the land slopes in that direction. Others flow east, others south or west or in directions in between. A river must always flow toward lower land. The part of a river near its source is called the upper part of the river. The part near its mouth, or the place where the river flows into the ocean, is called the lower part. Find another large river on this map. In what direction does it flow?

Scale of miles on a map. Find the *scale of miles* on the map on page 89. The scale shows that each inch on the map stands for 250 miles on the earth. Now look at the scale of miles on this map. Each inch stands for 635 miles. Two inches stand for 1270 miles, and three inches for 1905 miles. You can measure the distance between any two places on this map and then compare that distance with the scale of miles. In this way you can find how far apart two places are.

Now locate Lake Victoria. Let us use the scale of miles to find the distance from Lake Victoria to the mouth of the Nile. Measure with a ruler the number of inches between these places on the map. The scale shows that each inch on this map stands for exactly 635 miles. To find the distance from the lake to the river's mouth you will need to multiply 635 miles by the number of inches you found. Now measure the longest distance that the Sahara covers from east to west.

The scale of miles is not the same on all maps and globes. Africa covers more space on this map than on the maps on page 145. We say that this map has a larger scale than those on page 145. One inch of this map stands for 635 miles on the earth. On page 145 less than one half inch on the map stands for 635 miles on the earth. See if there is a scale of miles on your classroom globe.

THE SAHARA

West of the Nile River is the dry and dusty Sahara, which stretches all the way across the continent to the west. Notice that the Sahara is north of the equator and is crossed by the Tropic of Cancer. You can see from this map that the Sahara is not all level land. There are mountain ranges rising from its surface. During the winter the highest peaks are capped with snow.

In some parts of the Sahara, *dunes* reach in every direction as far as you can see. A dune is a hill of sand shaped like a snowdrift. In the Sahara the dunes are a

Sand dunes in the Sahara. These people are desert nomads resting with their camels.

EWING GALLOWAY

EWING GALLOWAY

Besides the oases, which have large springs and fruit trees, small water holes like this one provide water for the thirsty traveler.

yellow brown. The sand is blown about from one place to another, and the position of the dune is always changing. The greater part of the desert, however, is made up of rocks and gravel. Parts of it are very hot on a summer day.

On the eastern side of the Nile the arid land extends beyond the Red Sea into southwestern Asia and then almost all the way across Asia. But only the African desert is called the Sahara. Look at the rainfall map on page 81 and notice how little rain falls on this great desert.

Oases in the desert. Here and there *oases* are scattered through the Sahara. An *oasis* is a low spot in a desert where water can be found. Sometimes there are large springs or even lakes in an oasis. Here you will find date palms and sometimes other fruit trees. There may even be farms and small villages with flat-topped houses of sun-baked clay.

Traveling on the desert. No railroad goes very far into the Sahara. Instead, *caravans*, or groups of loaded camels with their drivers, plod slowly on from one oasis to the next. The people of these oases must have supplies brought to them. Some articles, such as dates, are brought from the oases to people who live near the seacoast.

In this dry land the drivers of a caravan may travel for days without seeing other people. Sometimes a sandstorm strikes a caravan. The air is filled with blowing sand that chokes men and animals. Then the camel lies down facing away from the wind. Its driver spreads a blanket over the camel and himself for protection until the storm has passed.

The camel that is used in this land has only one hump. It can live on thorny desert shrubs. Since it has a stomach for storing water, it can go several days without drinking. For these reasons the camel is the chief beast of burden from one end of the Sahara to the other. It is the only animal that men use when traveling long distances in the desert.

The people in a caravan always carry water with them. They also take blankets to keep them warm at night. The desert with its clear skies cools rapidly at night. There is no blanket of clouds to keep it from cooling.

Desert nomads. On the Sahara herds of sheep, goats, or camels can find hardly enough grass to feed upon. Here the owners of the herds wander with their animals in search of feeding grounds. Many of these people are true nomads, for they have no fixed home. But they return to an oasis now and then to trade the skins and meat of their animals for foods raised in the oasis. Some of these nomads go back often to the same oasis.

Can You Use Your Geography?

At the top of your paper write two headings: Desert, Nile Valley. Then under Desert write each thing in the list below which you would see in the Sahara outside the Nile Valley. Under Nile Valley write each thing which you might see in the Nile Valley. Some things might be seen in both places. Write them in both columns. There are a few things in the list which you would not see in either place.

water wheels
water buffaloes
children
vegetables
churches
mud houses
green fields
date palms
reindeer
caravans
cotton
donkeys
camels
rocks
ditches
walruses
tundra
wheat
wells
plows
seals
oxen
river
trees
sheep
snow
hoes
boats
sand
grass

WORKING WITH MAPS

1. Draw a map of the Nile River. Show the equator, the Tropic of Cancer, the White Nile, the Blue Nile, and Cairo.

2. Read the scale of miles on your globe. Wrap a string around the globe at the equator. Cut the string so the ends just meet, and measure the string. How far is it around the earth at the equator?

3. Find these places on the globe:

a. Continents: Africa, Asia, South America, North America.
b. Rivers: Nile, Amazon, Mississippi.
c. Seas: Mediterranean, Red Sea.
d. A cold land, a warm land, a very rainy land, and a very dry land.

WORDS TO EXPLAIN

source (of a river)
mouth (of a river)
water buffalo
cotton boll
palm (tree)
water wheel
flood plain
sandstorm
arid
oasis
desert
delta
irrigate
mosque
pyramid
caravan
mummy
camel
millet
shadoof
famine
sickle
thresh
potter

QUESTIONS ON WHAT YOU HAVE READ

1. Why does the Nile have so much water when it flows through a desert?

2. How did the building of the Aswan Dam across the Nile change the villagers' methods of farming? Which changes were good and which were harmful?

3. How can the Nile farmers raise crops in a land where it seldom rains?

4. What would happen to the farmers' fields if they were not irrigated?

5. How do the Nile farmers differ from the Forest Indians in their ways of farming? Which of these two peoples uses the more simple methods?

6. Why do the Nile farmers use mud bricks in building their houses?

7. Show how simply the Nile People live, by describing four of their methods of work. Show also that their ways of living are not so simple as those of the other peoples whom you have read about in this book.

EDWARD C. HUDOWALSKI

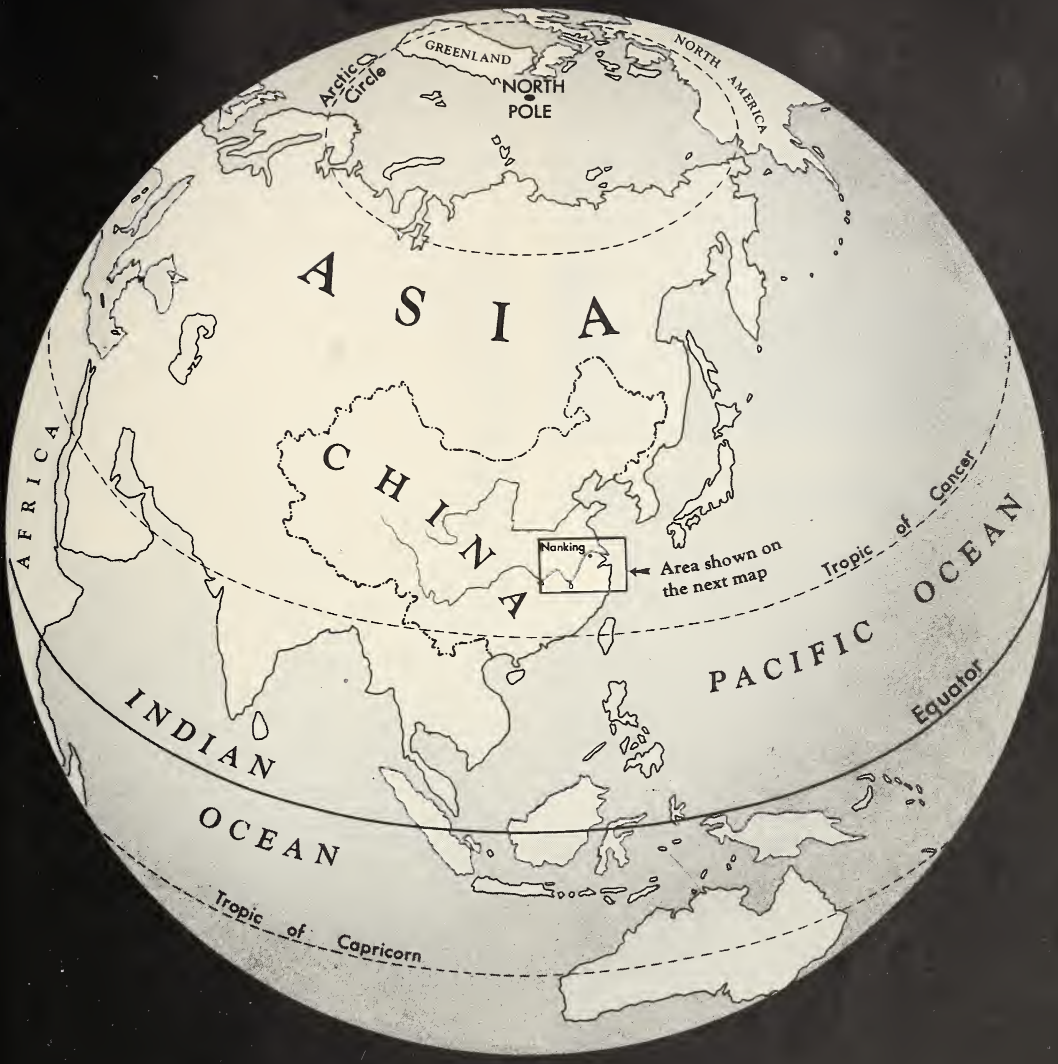
Chinese women are washing clothes in a small stream that runs through their village.

Rice Farmers of China

Far away across the Pacific Ocean, in eastern Asia, is the country of China. It is a crowded country. In China there are almost three times as many people as live in the United States. Some of these people live in cities and earn their living by working in stores and offices and factories. But most of them live on farms, growing almost everything they use. They are subsistence farmers, but the subsistence farming of China is much different from that of the Forest Indians. The Chinese subsistence farmers are among the most skillful farmers in the world.

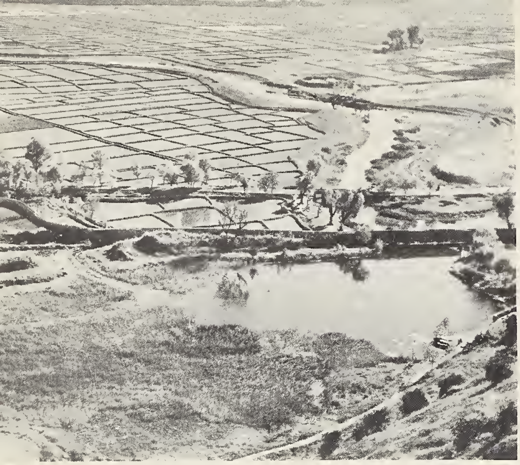
The people of China. The Chinese belong to the *Mongolian* race. Perhaps you know some Chinese people. Their skin is light tan, and their hair is black. They have high cheek bones and their eyes slant a little toward their noses. Those who make their living by farming are burned by the sun and wind until their skin is brown.

The farmers of China work hard, and they know the best ways to farm their land. They are thrifty people, too. They



have ways of using everything. Nothing is ever wasted or thrown away. Even the ashes from the stove are saved to fertilize the fields. After a farmer's wife washes a floor, she does not throw away the water. Instead she waters the fields with it.

Large families. Because the Chinese farmers are subsistence farmers, living on what they can grow on their farms, their children do not usually go away from the farms to earn their living. Instead the families stay together. Therefore a Chinese household is made up of many persons. There are the grandparents, the father and mother, the children, and the families of the married sons, all living in



FRITZ HENLE

These rice fields are on low land. They can be flooded with water from rivers and canals.

the same house or in houses close together. The older people govern the family and are the most respected members. A son is expected to follow the wishes of his parents even though he is a grown man himself. The members of the family all take care of one another. A strong man who can work hard and grow large crops is expected to help his poorer relatives.

A thirsty crop. Many farmers who live in China grow rice as their main crop. Rice was first grown in the eastern hemisphere. It is the most valuable of all the crops that men raise today. It is worth as much as all the world's wheat and corn put together. It is the main food of the farmers in this region. They grow other things too, but they live mostly on rice.

You know that crops need water either from rainfall or from irrigation. Rice is a very thirsty crop and can be grown only where there is plenty of water. During the growing season water must be kept standing on the fields where the young rice is growing. If the water were allowed to drain off the fields, the young rice plants would die.

Water for the rice fields. There is usually plenty of water for crops in the area where the rice farmers live. During the spring and summer the rains are so heavy that moisture settles everywhere. Water drips from the walls and ceilings of the farmers' houses. If they have stored away any grain or dried food, it spoils quickly because the air is so damp.

The rice farmers know just how to arrange their land so that they always have water for the growing rice. They dig many shallow ponds in the higher land above the fields. Usually the ponds are at the foot of a hill. The ponds catch the water as it runs off the higher land after a rain. Since the ponds are on higher ground than the rice fields, the water will flow downhill into the fields.

The farm plots are separated by banks or ridges of earth, called *dikes.* On top of these low dikes are paths that the farmers use as they walk from one field to another. When a farmer wishes to irrigate his fields, he cuts an opening in the bank of a pond with his hoe. The water runs down on the field. When there is enough water on the field, the farmer fills the opening in the bank of the pond with earth.

A RICE FARMER AND HIS FAMILY

In a farm village in southern China live a Chinese farmer and his family. This village is south of the Yangtze River near the city of Nanking, the capital of China. Find the Yangtze River on the globe on page 105. The Yangtze is one of the world's great rivers. Now find Nanking. The farm village is too small to be shown on this globe, but it lies just east of Nanking.

Both the farmer and his wife wear long

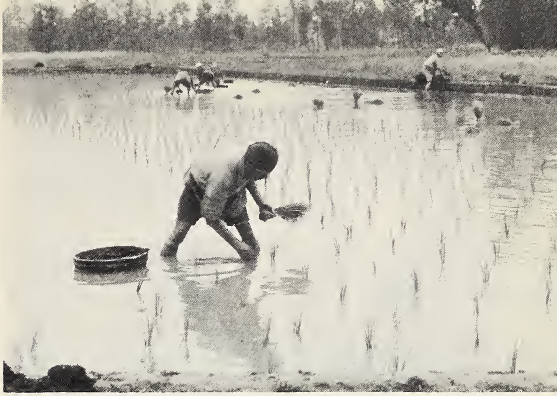
blouses and trousers of blue cotton cloth. Their winter clothes are also made of cotton but are thickly padded for greater warmth. The trousers are full at the waist and are tied with strips of cloth. The farmer's wife makes most of the clothes for her family.

The man's farm is made up of several small plots of land scattered through the village where he lives. All together these plots are only about the size of a large garden. The farmer's house is in the middle of the village. Here are also the homes of the other rice farmers.

Preparing the fields for rice planting. In the spring the farmer plants rice in his fields. Before planting time he repairs the dikes around his *paddies*, as rice fields are called. After hard rains he examines the dikes to see whether any parts have been washed away. While the rice is growing, the paddies must be kept covered with water.

After the first spring rains the farmer spades each of his plots by hand. A spade, as you know, is a sharp gardening tool like a shovel, used to turn over the topsoil. Some Chinese farmers use a hoe. Others plow with an ox or water buffalo hitched to a wooden plow. The plow has an iron tip. Still other farmers pull their plows themselves, for they are too poor to provide feed for a work animal. The farmer goes over each field again and again until the soil is broken up into small pieces. Then he rakes the small plot several times.

Planting rice. Two weeks before rice-planting time the farmer drops grains of rice close together in a tiny seedbed. This seedbed is just a small corner of one of his fields. He keeps the ground covered with water. Soon the seeds sprout into young, tender plants, called *seedlings*.



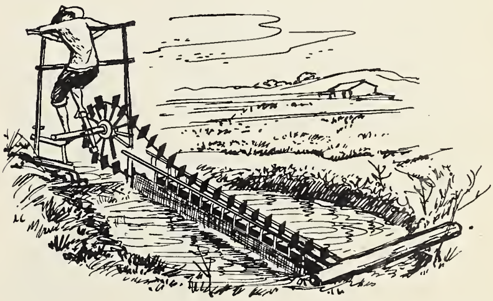
CNS PHOTO FROM PAUL GUILLUMETTE

Planting rice seedlings. They are planted singly, but each seedling has many stalks.

When he is ready to set out his rice plants, he pulls up a handful of seedlings and ties them loosely together with straw. He keeps on until he has many bundles. These, he scatters over the wet ground.

Then one by one he sets out the young rice seedlings in a water-covered paddy. He plants them several inches apart so that they will have space to grow. Until the rice heads are formed, he keeps the ground soaked with water.

Irrigating the fields. Sometimes if the water is low in the ponds above the rice paddies, water is pumped from a neighboring pond or a canal with a chain pump. You can see one of these pumps in this picture. The man works the large wooden wheel with his feet. As the water is pumped up, it runs through a trough



JAMES SAWDERS — COMBINE

In China the carrying pole is used to carry many things. This man carries pails of water.

out over the land. Every paddy must be flooded three or four times during the growing season.

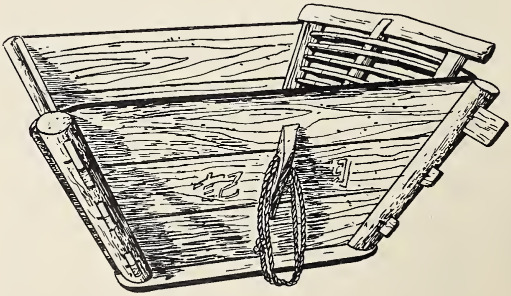
Caring for the rice paddies. Taking care of rice paddies is hard work. The farmer pulls the weeds by hand, splashing along in the muddy water. To protect himself from the hot sun, he wears a straw hat shaped like the top of a silo. He weeds the fields so often and so well that weeds never really get a start. Sometimes his wife and children help, or his two older sons may do this work.

The farmer keeps his land from losing its richness. Three or four times during the growing season he fertilizes the soil. For fertilizer he saves waste material such as garbage, until it decays. He uses grass and leaves which have been kept wet so that they will rot. He uses ash from the wood with which his wife cooks. Sometimes he takes up mud from the bottom of a pond and spreads it over the fields. The manure from the animals is used as fertilizer.

As soon as the green rice plants show above the damp ground, the farmer carries fertilizer to the paddies. He hangs two buckets on the ends of a pole which he hangs on his shoulder. These are filled with fertilizer. He fills a dipper from one of the buckets. Then he pours a little fertilizer around each plant. This farmer always uses the fertilizer just when the fields need it. The paddies would not grow rice year after year if they were not well fertilized. By great care of the land this Chinese farmer is able to get a large quantity of grain from his small fields.

Harvesting and threshing the rice. As the grain begins to ripen, the color of the rice plants changes to a golden yellow. Now the farmer drains the water off his fields. The ground dries and hardens.

The farmer goes to the field with his sickle, his *threshing box*, and a large square basket. Perhaps you have used a sickle to cut high grass or weeds. With the sickle he cuts the rice plants low on the stalks. He cuts several of the plants at a time and lays them on the ground in bunches.



When all the rice has been cut, the farmer begins threshing. His two older sons help him. He takes a bunch of rice plants and hits it again and again against a wooden frame inside the threshing box. This frame is made of slats, one above the other. As the plants strike against the frame, the grains of rice are loosened from the heads and drop into the box.

After the threshing in one part of the field is finished, the men slide the box along to another part. They keep working until all the bunches scattered over the field have been threshed. As the box fills with rice, one of the men scoops the grain into the large basket. This basket is made of *bamboo.*

Bamboo, you know, is a treelike grass with jointed stems. Some kinds of bamboo trees, as they are called, grow over a hundred feet high. They are found in southern China as far north as the Yangtze River. You will learn more about bamboo and the ways in which the Chinese people use it when you read later about southern China. Bamboo is also used to make a mat which is stood up inside the threshing box on three sides. The mat keeps the rice grains from falling outside the box. On the fourth side, the threshers strike the rice plants against the slats.

Some Chinese farmers hang up the rice stalks to dry before they thresh the grain. Later they thresh the rice by drawing the stalks through the teeth of a large wooden or metal comb. Or they may have oxen or water buffaloes walk round and round over a pile of the rice stalks.

The threshed rice is not white and shiny as you might expect. The grains are still covered by brown husks. This rice is stored with the husks on in bags until the farmer and his family need it for food. Then it will be husked by hand before it is cooked.

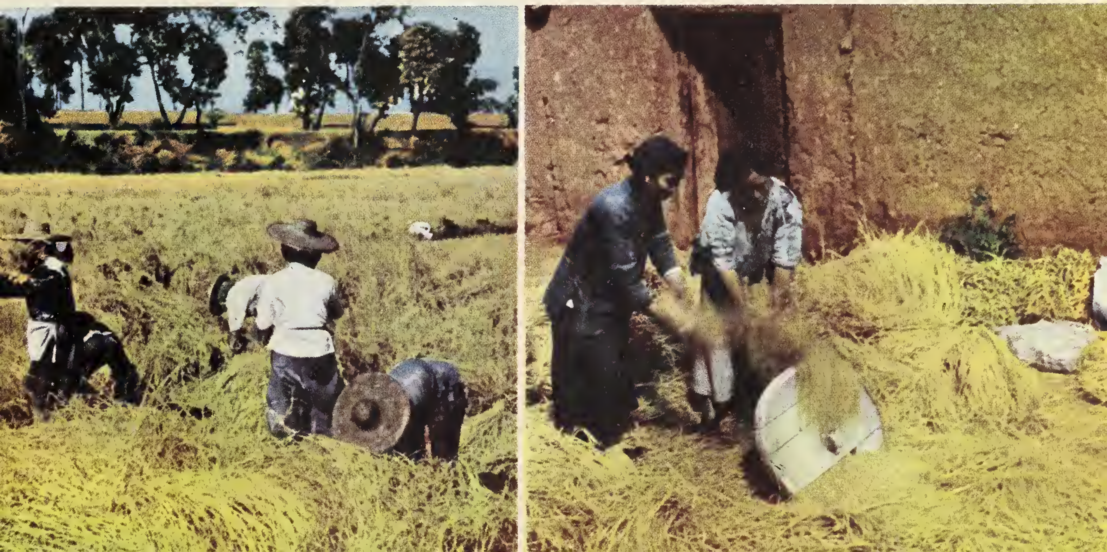
So you see the Chinese farmer fertilizes his plots, carefully cultivates the ground, and works very hard to get as large crops as he can. But since his fields are small, his crops are small. He and his family have only a bare living. They are very poor.

Farming the year round. Find the lower Yangtze Valley on your globe. Notice that it is about as far north as the southern part of the United States. In the summer the weather in this valley is hot. It is much like the weather in the southeastern part of the United States. There are only two months, from late December to late February, when there is likely to be frost. The people can grow crops for the other ten months of the year.

Half the year, from March through

Cutting and threshing rice. Not all Chinese use threshing boxes. Some farmers strike the rice stalks against a wooden wheel, as in the picture on the right, or against a stone.

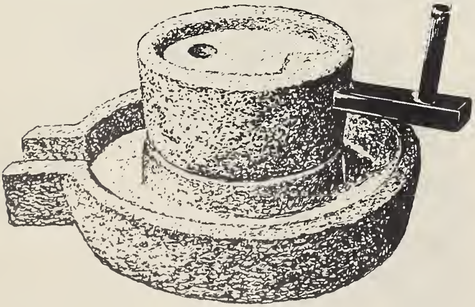
EDWARD C. HUDOWALSKI



August, it is rainy in the Yangtze Valley. The other half of the year the weather is drier. But December and January are the only really dry months. Some crops need a lot of rain, others only a little. The rice farmers grow thirsty crops, like rice, in the warm wet summer. In winter they grow crops that need less water, like wheat and barley. Some farmers also raise beans and other vegetables at the time of the year when rice is not grown. The people raise all the food crops they can. But rice is by far the most important crop.

Growing wheat. Wheat is the most important winter crop. After the rice harvest in October, the farmer spades his fields into ridges a foot or more high. This is done so that the water will run off during the spring rains. Either wheat seeds or young wheat shoots are planted on these ridges. After the plants have begun to grow, the farmer spends hour after hour hoeing between the ridges. By November the fields are again green, this time with wheat. In early spring before the rains begin, the grain is ready to be harvested.

After the stalks have been cut with the sickle, the farmer beats the grains out of the wheat heads. Then he separates the kernels from the chaff in much the same way as do the Nile farmers. He throws a shovelful of the wheat into the air. The chaff is blown away because it is light. The heavier kernels fall to the ground.



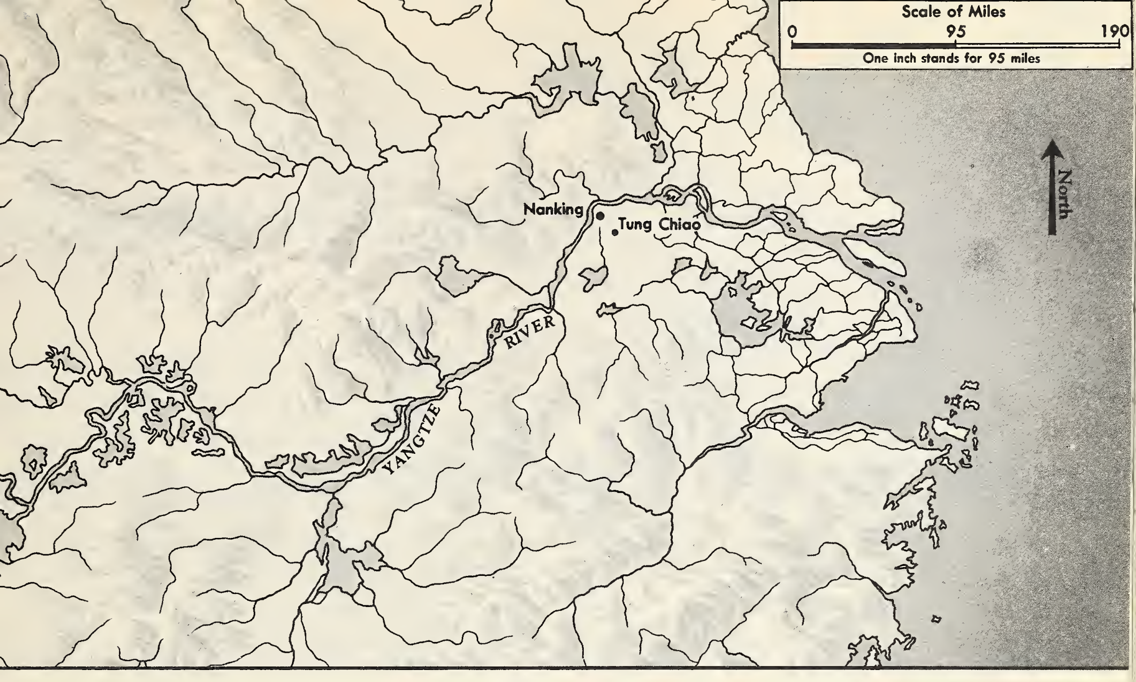
You see that the farmers in this village get two crops a year from the same land. But even though the farmers work hard and the crops are large for the size of the fields, the quantity of food for each person is small. The farms are so small and there are so many people to feed, that each person gets only a little, even when the crops are good.

Making flour. Each family grinds its own wheat into flour. The mill used for this purpose is made of two flat stones, one placed on top of the other. Below the mill is a dish to catch the meal.

The country people use wheat flour for noodles, dumplings, and biscuits. In China, however, nothing is added to the biscuit dough to make it rise.

How the villagers work. Every day the women have many kinds of work to keep them busy. A Chinese woman rises at dawn, lights the fire in the stove, boils a kettle of water, and carries bowls of tea or hot water to her husband and to each of the older people in the family. Her day is filled with work. She cooks, cleans the house, and cares for the children. She spins thread on a bamboo spindle. She makes and mends clothes. She makes her own brooms, string, and baskets. She also cares for the animals and sometimes helps in the rice fields. On washday she takes the family's clothes down to a near-by pond. To make them white and clean, she puts a roll of the wet clothes over a stone and beats them with a wooden paddle. With so many tasks she is never idle.

The men, too, are always busy. With hoes on their shoulders they walk almost every morning to their plots of land and cultivate their crops. Few farmers have



animals to carry burdens. Therefore the men must do that work themselves. The men often go fishing. But with them, fishing is work, not a sport. Fish is an important food of the people who live near rivers or canals.

THE YANGTZE VALLEY

This map shows the valley of the Yangtze River. Find the part of the valley farthest from the sea. Now follow the river east to the sea and notice that its valley is sometimes wide and sometimes narrow. Where do you see hills on this map?

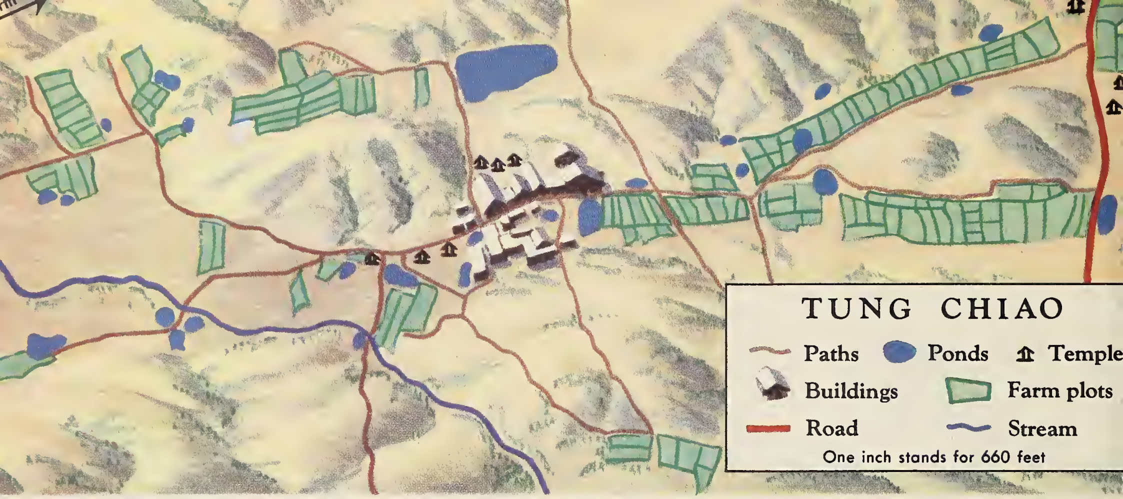
On many of the hillsides farmers have worked hard to cut broad level strips of ground on which to plant rice. These strips, which look like wide steps, are called *terraces*. Low dikes are built across the terraces. These dikes divide the fields into small plots. Such paddies are flooded by water from ponds near the top of the hill. The water flows from one paddy to another as the men open and close small holes in the dikes.

Where do you see low level land? Like the Nile River the Yangtze has built up a delta with soil brought down in time of floods. Many farmers and their families live crowded together on the fertile Yangtze delta.

In no other part of the world are there so many waterways as in the lower Yangtze Valley. In several places there are large lakes. On either side of the lower Yangtze are many canals. These bring water to every one of the many tiny farms into which the land is divided. This water is used to irrigate the farms. The waterways are also used for transportation. Many boats travel on the river and the canals.

Tung Chiao. The farm village about which you have been reading is named Tung Chiao. You remember it is just south of the Yangtze River and west of Nanking. Find Tung Chiao on this map.

This village covers less land than a



medium-sized farm in the United States. Yet about fifteen farming families live in this village, and they own their own land. Tung Chiao is only one of many farming villages in the Yangtze Valley. Because so many farmers live in this region, each can have only a very small farm.

Near Tung Chiao are some low hills too small to be shown on the map on page 111. But most of the land is level. See how the Yangtze River curves about as it flows toward the sea.

A map of Tung Chiao. Now look at the map of the village of Tung Chiao on this page. This map shows how the village is laid out. Look at the key to see how buildings are shown on this map. Notice that all the farm buildings are close together in the middle of the village. Small level plots of land near by are used for raising crops, mostly rice. These plots are the best farming land in the village. The farmers do a great deal of careful work on them by hand or by using simple hand tools. All during the planting, growing, and harvesting seasons the farmers are busy on these small plots of rich land.

Each farmer owns several plots of the best valley land and some hill land too. Some of the hilly land is used for a village graveyard. Other hilly areas are planted in crops that do not need to be irrigated. Much of the hilly land is covered with grass and bushes that furnish fuel.

See whether you can find several of the ponds at the foot of the hills. What is the water in these ponds used for?

On this map find the wide road. Next see the paths that lead from one farm to another.

Helping each other. If each farmer cultivated his own plots of land, he might have to walk some distance from one plot to another. Each farmer, therefore, takes care of several plots that are within easy walking distance. The plots which he cultivates may not all belong to him. Some of his own plots will be cared for by another farmer. By sharing the work the farmers get more done in a day.

In these small Chinese villages many families are related. When a man dies, his land is divided among his sons. In the past the sons have nearly always remained in the villages and become rice farmers. Two brothers or two cousins may help each other. But today some of the young Chinese are leaving the farms to go away to the cities.

On the map see the tiny Buddhist temples in this village. Here many of the people worship, for Buddhism is one of the religions of the Chinese. Some of these small places of worship are in the fields. People stop there on their way to and from work.

Scale on maps. Turn again to the globe on page 105. Tung Chiao is much too small to be shown on this globe. This globe shows so much of the world that you cannot see little things. The map on page 111 is drawn to a larger scale. Although this map shows less of the world, the Yangtze Valley is larger on it than on the globe on page 105. The village is shown on the map on page 111.

Yet even on this map Tung Chiao is only a very small dot. You cannot see such things as the ponds in the village, the separate farm buildings, or the plots of land that the farmers cultivate. Even a map of a small part of the world cannot often show things as small as these.

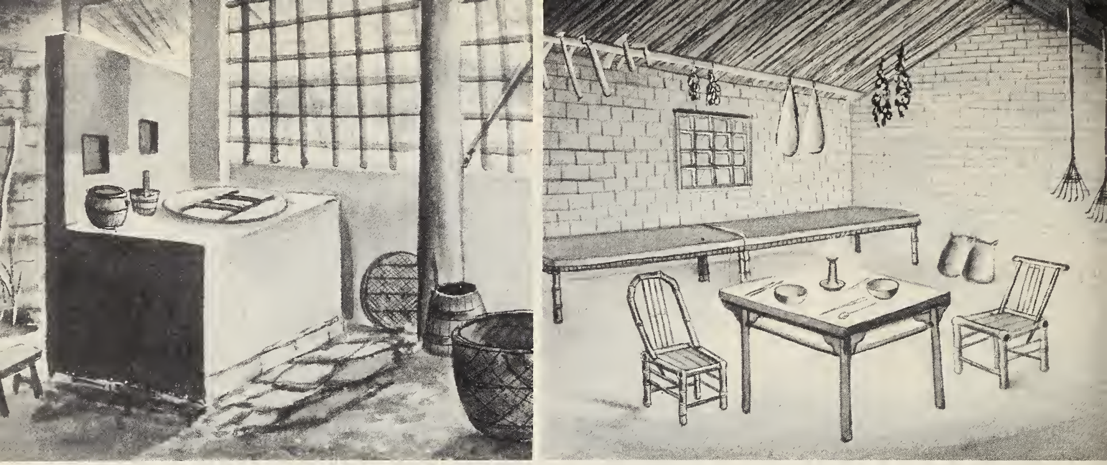
Now look once more at the map of Tung Chiao on page 112. This map uses almost a third of a page to show the tiny area that is named Tung Chiao on the map on page 111. The map of Tung Chiao on page 112 is drawn to a much larger scale. It shows the village much more clearly, but it shows a smaller part of the world.

Village houses. You have seen on the map of Tung Chiao how all the villagers have their homes in the middle of the village. Their houses have walls made of clay bricks plastered together with mud. The floor of the house is hard-packed earth. Usually each house has a small square opening for a window. In winter this opening is covered with paper to keep out the cold. The wooden rafters of the roof are covered with straw, which is tied to the rafters with string. A thin layer of wet clay is spread over the straw. Then still more straw is laid over the clay.

The string used in the house is made of *hemp*, which grows in the central part of the country. The hemp plant in China grows over five feet high. It has large green leaves, white flowers, and little round seeds. The leaves contain the fibers used in making string. This plant needs a climate which is not very hot and not very cold. It needs a fair amount of rain. Hemp fibers are used for making strong rope as well as string.

EDWARD C. HUDOWALSKI

The little boy is using chopsticks to eat rice from his small bowl as his mother and sister look on. Chinese children become expert with chopsticks at an early age.



On the left is a Chinese kitchen. You can see the stove and the wooden cover over the cooking bowl. On the right is the main room of the house. Notice the furniture and the lamp.

A Chinese kitchen. At one end of the house is a kitchen shed. It too is made of clay bricks. In this small, dark kitchen is a stove quite different from those you have seen. It is really four brick walls about four feet high, built to hold a large iron cooking bowl. This bowl fits into a hole in the top of the stove. The back wall has a hole where fuel is put in. This wall is built higher than the others in order to keep the smoke and soot from the cooking. The house has no chimney.

Besides the large stove there is a small stove in the kitchen. It is built against the wall with a top opening just large enough to hold the tea kettle. This stove has an open front. Here a fire is kept burning so that the members of the family can make hot tea when they want it.

Inside the house. This house has only one room besides the kitchen. Strings of dried onions and garlic hang from the rafters. Farm tools and bags of seed hang there too. In one corner of the house rice and wheat are stored in bags. For furniture there are bed frames, a few chairs, boxes for storing clothes, a table, and enough bowls, spoons, and *chopsticks* for each member of the family. Chopsticks are thin sticks of wood or ivory. They are used in eating. Holding a pair of chopsticks in one hand, the Chinese pick up rice or other foods and lift them to their mouths.

To light the room the Chinese use a small bowl filled with *soybean* oil. A twist of cotton floats in the oil and serves for a wick. The soybean, which is smaller and harder than a lima bean, has many uses in China. The sprouts of the plant are eaten as a vegetable. Oil pressed from the beans is used not only to burn in lamps but also as food.

Of course, not all Chinese people live in such simple houses as these villagers. In China there are also large houses having many rooms.

What the villagers eat. Rice, you remember, is the main food of the farmers and their families. It is usually boiled and served in bowls without salt. Other common foods are cabbage, bamboo sprouts, and noodles which the women make from wheat flour. Soybeans are also a favorite food, and they are very healthful. In fact, great quantities are used in China.

There are no beef or dairy cattle in the village. In such a crowded region as the lower Yangtze Valley there is little land to spare for pasture. The people eat most of the crops themselves instead of feeding the grain to cattle or sheep and raising them for their meat. Hogs are the only large animals grown for meat. They need little space, and they will eat things that might otherwise go to waste.

Most of the farmers keep ducks, hens, or geese for eggs and meat. Yet foods from the fields are the most important. If a farmer has a very good crop, he may have a little to sell for money. Then for holidays he can buy a little beef, salted fish, or salted carrots at the market.

In China drinking water is always made pure by boiling. The people also drink hot tea. At work and at rest they have a cup of tea now and then. Hot tea is always served to the friend or stranger who comes to the home.

WHY THE YANGTZE FARMERS HAVE SMALL FARMS

You have learned that the Chinese rice farms are tiny patches of land. Let us see why the farmers do not take care of large farms.

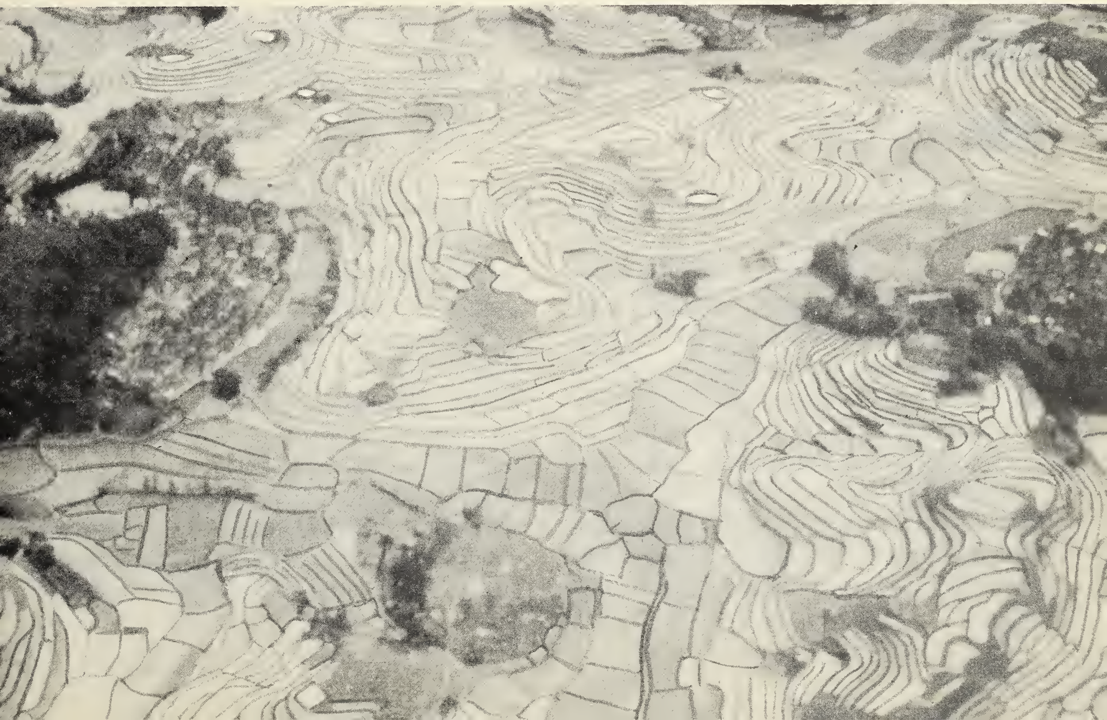
The crowded Yangtze Plain. You remember that the Yangtze River winds east among the hills to the sea. The Yangtze Plain is only a small part of the land in South China. But on this plain millions of people have their farms and depend on farming for their living.

We have a special word to mean the number of people who live in a region. This word is *population*. The number of people who live in New York City is the population of that city. And the number of people who live on the Yangtze Plain is its population.

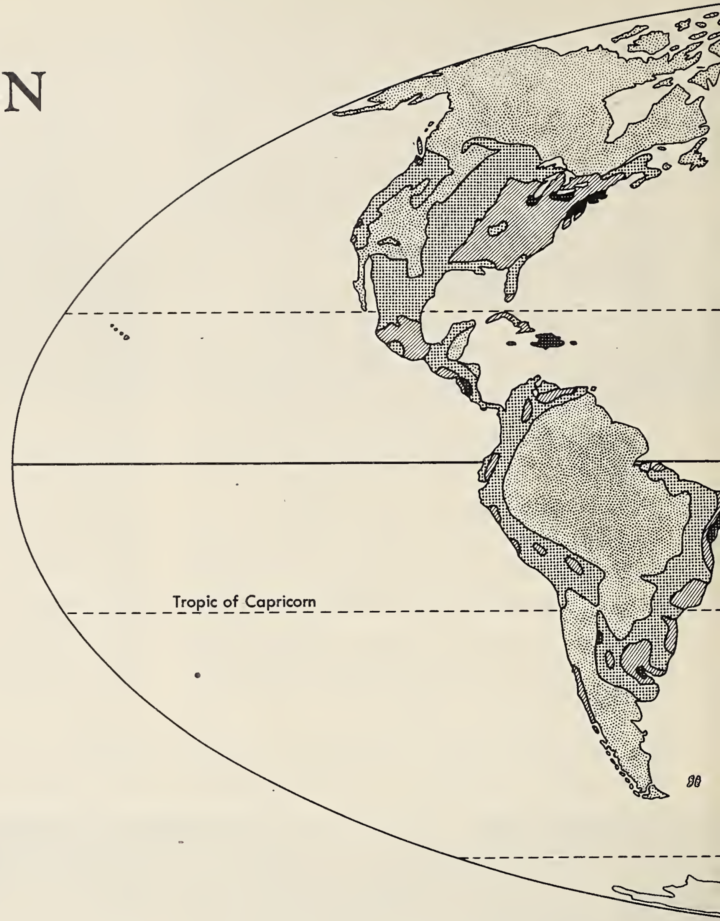
There are regions in the world that are

Rice terraces in China. The hills are terraced all the way to the top, and almost every bit of land is cultivated. See the ponds near the top of each hill. How are they used?

EDWARD C. HUDOWALSKI



WORLD
POPULATION



KEY

░ Very thin

▒ Thin

▨ Medium

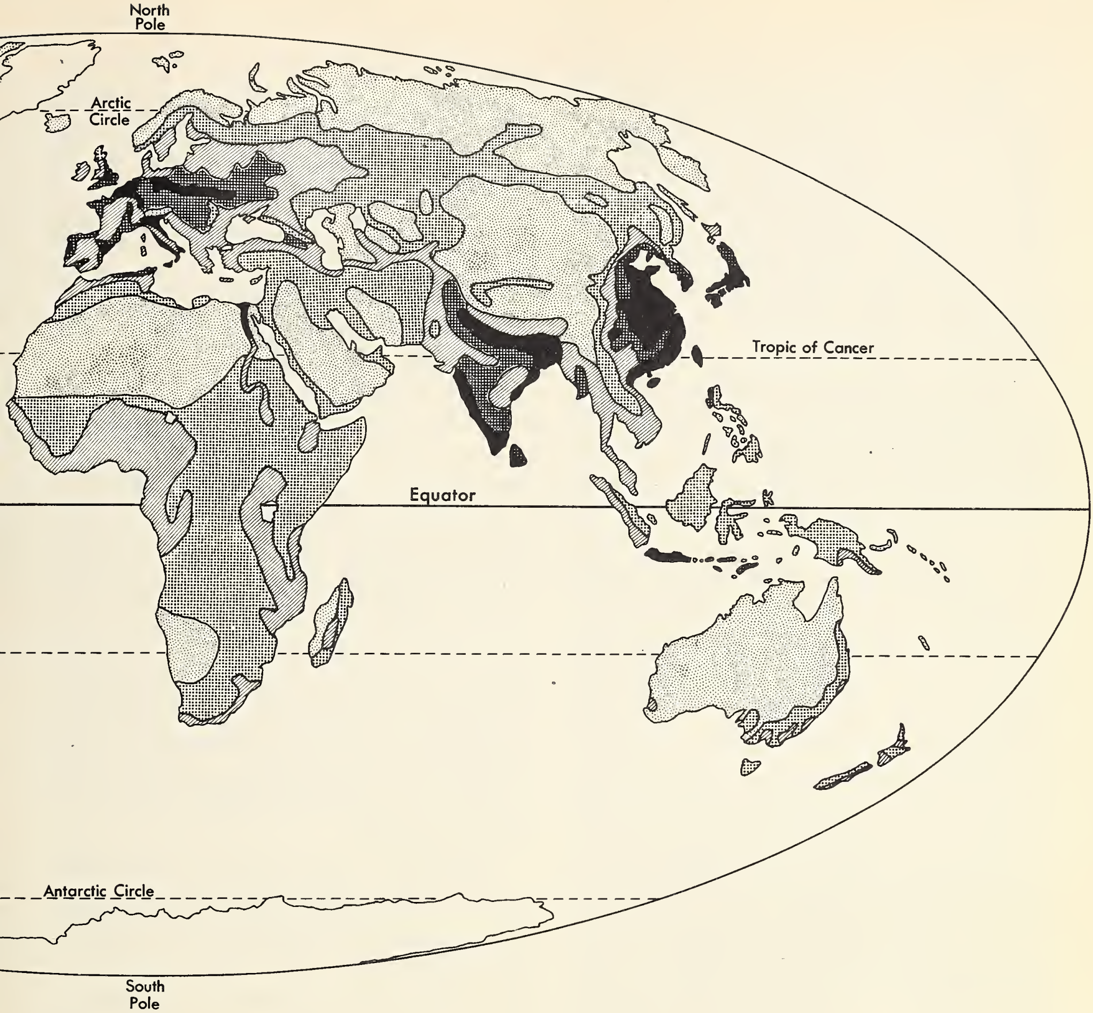
▓ Dense

■ Very dense

crowded with people. But there are other regions just as large where very few people live. The Yangtze Plain is one of the crowded regions. We say it has dense population. The regions having few people are called thinly settled, or thinly *populated* regions. In between are regions with medium population.

A population map. This map shows where the people in the world live. Altogether there are more than two billion people living in our world. This is such a large number that you can hardly imagine so many people. The map shows you where many people live and where few, or no, people live. It is called a population map.

You should always look at the key of a map to see what each color or shading means. What color is used on this map for regions which are very densely settled? See if the Yangtze Plain is that color. What shading is used for regions that are very thinly settled? Is northern Canada shaded that way? If so, you have found the right shading. Now find out what



each of the other kinds of shading means. The key tells you.

Now find the Sahara, which reaches all the way across northern Africa. You would expect to find few people in a desert. Is this true of the Sahara? Explain why a narrow strip of this desert is densely settled.

What does this map tell you about Tierra del Fuego at the southern tip of South America? Does this agree with what you have read about the Canoe People?

From this map you can see that the Yangtze Plain, about which you have been reading, is one of the most densely populated places in the world.

Farming by hand. In the Yangtze Valley farm work is done by hand. The farmers use simple tools rather than machines. They have no machines for plowing the land, fertilizing it, cultivating the soil, or harvesting their crops. They work in their fields with a hoe or a spade as a man in the United States might work in a garden in his back yard. Such methods of farming are good but very slow. A worker cannot take care of a large farm.

These slow methods of hand labor have been used in China for thousands of years. The farmers work hard during the planting season to set out their rice plants early enough. While the rice is growing, they are busy caring for their fields. Then harvest comes. Again they are busy, for they must gather, thresh, and store the rice.

The farmers do not have time to cultivate the poorer, hilly land near the village. Because they must farm by hand, they are able to make a living only on the better land. For this reason, there are not many farms in the poor, hilly land around the Yangtze Plain. Instead, great numbers of people have settled on the plain itself. But there is not enough good land on the Yangtze Plain for all the people there. So the farmers have small farms and can get only a bare living.

No farm machinery on the Yangtze Plain. People in some parts of the world use farm machinery to work vast stretches of land in a short time. Often they use poor as well as good land. Of course, they do not get as much grain from the same amount of land as a Chinese farmer does. But their whole crop is usually much larger. The Chinese rice farmers cannot work their land in that way. They could not use farm machines even if they had enough money to buy them. Some of the farm plots, you know, are terraces cut in the hillsides. Large machines can hardly be used on such fields. Nor can farm machines be used in the rice paddies. Most farm machines are heavy and would sink into the soft mud. Also the paddies are so small there is not enough space to move farm machines around.

The farmers of South China cannot, like the people of other lands, use machines to cultivate the poorer land. Farm machines are best used in level or gently rolling country. South China is hilly land, and farm machines cannot be used on steep hillsides. Unless terraces are made, most of the hillsides are too steep to be cultivated at all.

Subsistence farmers. The rice farmers who live in this densely settled valley work hard to till small plots of land. They seldom are able to raise more than enough food for themselves and their families. Unlike the Forest Indians, the Chinese rice farmers use the same land year after year. Their methods of farming are complex. Though they do much of their work by hand, their tools are skillfully made. They fertilize and cultivate the soil well. After one crop is harvested, they plant a different crop in the same field. They get large harvests from small rice paddies and hillside terraces. They make good use of pigs, poultry, and fish in providing food for their families and fertilizer for their fields.

Although these Chinese are skillful farmers and allow little to go to waste, now and then great numbers of the people face starvation. The crops on many of the fields may fail because of floods or dry weather. Then the farmers may have no way to get enough food to keep themselves and their families alive until they can plant and harvest another crop.

The rice farmers continue to use the farming methods which, as their fathers have found, produce the biggest crops from their small fields. They do everything possible to make the land produce. But seldom do they obtain even a little extra food which they may sell for money. It may take a long time for them to save enough money to buy the few necessities which they cannot make or grow.

Being Your Own Teacher

Bring to class two smooth, flat stones the size of small plates. Put a few grains of wheat on one stone. Put the other stone on top and turn it round and round while you press down on it. What happens to the kernels? Do you think a man using a stone hand mill would grind wheat kernels very fast?

THINGS TO TALK ABOUT

1. In what ways have you eaten rice?
2. How do Chinese farmers grow rice?
3. Why is it necessary for these farmers to fertilize the land heavily?
4. Name at least five ways in which people have made changes in the lower Yangtze Valley. Name one way in which the river has made changes.
5. What crops other than rice do the villagers grow?
6. Why do the Chinese rice farmers continue to use small farms only?
7. How do these farmers use animals?

MAP STUDY

1. On the map on page 80 notice the areas where the rainfall is under ten inches. These areas are deserts. Would you expect many or few people to live in these areas? What other map in this book do you need to show that you are right? Turn to page 116 and see how few people live in the desert areas.
2. Using the population map on page 116, find out which is the more densely populated region, the Yangtze delta or the Nile Valley.
3. Show that China can be reached most directly from North America by traveling north across the polar regions.
4. Be sure you can locate: Nanking, Yangtze River, lower Yangtze Valley.
5. On the map of a Chinese farm village (page 112) find the direction that is marked north. By using the scale of feet find the north-south distance covered by this village.

WORDS TO EXPLAIN

threshing box
chopsticks
population
populated
terrace
dike
paddy
spade
dense
hemp
sickle
gorge
bamboo
barley
soybean

AN IMPORTANT PICTURE

Study the picture on page 115 and then answer the following questions:

1. Where do you suppose the man was when he took this picture? Why?
2. Is rice farming an easy or a difficult way of making a living?
3. How does the picture show that it would be hard for the rice farmers to use heavy machinery?

A POPULATION QUESTION

Are the following places densely or thinly populated? Or do they have a medium population?

a. Where the Navajos live
b. Where the Nile farmers live
c. Where the Forest Indians live
d. Where you live

CATERPILLAR TRACTOR CO.

Preparing the soil for planting on a commercial farm. This machine breaks up the soil.

Gaining a Living from Our Earth

You have been reading about peoples who live in very different parts of the world. Some of these peoples live much simpler lives than others. Those who live in the most simple ways, you will remember, have few possessions and obtain their living from the region in which they live. They depend on themselves and trade little, if at all, with other peoples.

PRIMITIVE FISHERMEN AND HUNTERS

Generally, fishing and hunting are the occupations of peoples the world over who lead the simplest lives. The primitive tribes of Tierra del Fuego, you remember, make their living by fishing. A fisherman needs only his fishing tools to get food for his family. He does not need to own and care for animals. He does not have to own a store or other property to earn a living. The Eskimos also are primitive. They gain their living by hunting.

Live in thinly settled regions. The map of the world on page 121 shows where subsistence hunters and fishermen live today. The lands that are colored black are regions of subsistence hunting and fishing. You have read about several of them in this book. Peoples of the far north are hunters and fishermen. A few tribes of the southern part of South America also live by hunting and fishing. Many tribes in tropical lands depend upon the animal life of the land and the water for their living.

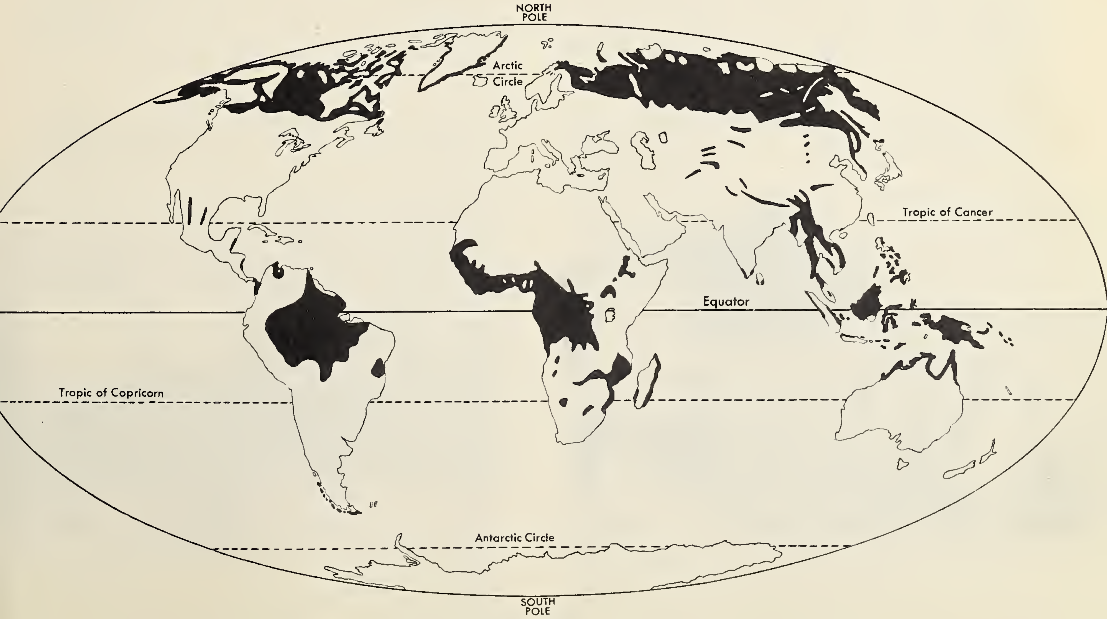
These primitive peoples live in parts of the world where there are great areas of unused land. In order to get enough food, they need a large amount of land. Look at the map again and notice the areas where primitive hunters and fishermen live. Now compare this map with that on pages 116 and 117. Notice that the population in most of these areas is thin.

Are nomadic peoples. Fishermen and hunters are usually nomadic, following the animals which they hunt. Because they move about often, they have very simple houses. Their houses are built easily and are often left behind when the families move. Their few possessions are things that are necessary to their way of life and are easy to move about. When the hunting is good, these people have plenty to eat. But when game or fish is scarce, fishermen and hunters and their families do not get enough to eat. They may even starve.

Are self-sufficient. Primitive peoples do well the things which they know how to do. The Canoe People are skillful at gathering shellfish. The Eskimo is one of the best hunters in the world. He has learned to make his living in the dark freezing days of winter and early spring, the warmer weather of late spring and summer, and the frosts and cold of early fall. He has learned how to make special tools, and he uses good methods of hunting.

Think of how the Eskimos get their clothing. The man kills animals which have long shaggy fur. He takes off the animals' coats of skin and fur. Out of the hides his wife makes shirts and trousers and boots for the entire family. The Eskimos do well everything that is necessary to keep themselves warmly clothed

REGIONS OF SUBSISTENCE HUNTING AND FISHING



in the coldest winter weather. They do the hunting, the cleaning of the hides, the cutting of the hides, and the sewing of the garments. Each Eskimo woman must know how to do many different things. Yet she makes just enough clothing for herself and her family. Every family produces the clothing it needs. There is no one who has to buy clothing, even if some families made more than they needed.

Primitive peoples know how to get their food, clothing, and shelter from the land near them. They depend on themselves for their living.

Are using new methods. Before the nomadic hunters and fishermen had anything to do with white men, they satisfied almost all their needs with animal products. They got food, shelter, fuel, clothing, and tools directly from animals or from the earth. But in time some of these people obtained tools from white explorers and traders. They now use steel needles instead of bone, and guns instead of bows and arrows. Hunting and fishing have become much easier. The men now have more time for other activities. By using the new methods they have been able to kill more animals than they did before. They have had more furs and other animal products to trade. But after years of such hunting there is not enough game left to provide food for the people. They must either starve or change their way of getting a living. Today nomadic hunters and fishermen are becoming fewer and fewer.

NOMADIC HERDERS

Thousands of years ago people living on the grasslands of central Asia began to capture wild animals and to herd them. At first these people used the animals for their flesh, hides, horns, and bones. They did not train the animals to work for them. Later they learned to use animals as beasts of burden. Different tribes in Asia kept herds of horses, donkeys, cattle, or other animals for this purpose.

In the western hemisphere there were few native animals which men could use so well. At the time of Columbus only the dog had been used by the natives of North America. Only the *llama* had been used in South America. Both of these animals are small for transporting goods. Nearly all the animals which men herd today were first captured, tamed, and herded in Asia. We say that man *domesticated* these animals for his use. We

These llamas are loaded and ready to start on a pack trip over the high mountains.

PHILIP GENDREAU, N. Y.

The hairy yak is used as a beast of burden on a high, cold plateau in western China.

EWING GALLOWAY

call them *domestic* animals. Today our domestic animals include horses, sheep, goats, cattle, chickens, and dogs.

Where nomadic herders are found. You have read about the people of northeast Asia who domesticate reindeer. They depend for their living on herds of reindeer which they pasture on great stretches of poor land. The land used by such primitive people is usually on the grassy edges of deserts or on the polar tundras. It is generally too cold or too arid for farming. It cannot even provide pasture the year round. The grass growing on the land is so short and scanty that it is soon used up.

Primitive herdsmen make up only a very small part of the world's population. They are found mostly in central and southwestern Asia, in northern Africa, and on the cold northern tundras. The lands where they live are thinly populated.

Animals that the herders raise. In areas where the pasture is very poor, as in the Navajo country, herders may raise sheep and goats. Where the pasture is better, they may keep cattle. On a high cold plateau in southwestern China, *yaks* are grown for their meat, milk, and long hair. The yak is a large, blackish-brown animal of the ox family. It has a heavy coat of long wavy hair over all of its body except the back. There the hair is short and smooth. The yak has black horns which curve upward and forward. Natives on the plateau use the yak also as a beast of burden. Horses and donkeys are also raised, chiefly to carry burdens but sometimes to provide meat. In hot, dry areas nomadic tribes use camels as beasts of burden, and in the Arctic regions, as you know, they use reindeer.

EWING GALLOWAY

A camp of nomads in the middle of the Sahara. The sheep feed on the desert shrubs.

Why the herders are nomadic. Since the pastures are quickly used up, primitive herdsmen move their animals every few days. The reindeer herders of far northeastern Asia must move their herds often during the winter. Other herders have to move their herds long distances with the change of seasons. The Navajos, you remember, live on one of the driest plateaus in the United States. They move about in search of water for their animals. In summer they take their flocks to high pastures. In winter they come back to the lower pastures in the valleys.

A simple way of living. Wandering herdsmen cannot be burdened with many possessions. Their shelters are the heaviest things they carry. Often these are tents which are easily taken down, packed, and transported. Most of the things the herdsmen use come from animals. But sometimes they obtain such products as tea or flour by trade. They eat chiefly milk, cheese, and meat. They make their clothes from heavy cloth woven from the wool or hair of animals. They often use hides and skins in building their shelters. Their tools are usually made of horn or bone. But even though all these necessities are obtained from the herds, the animals are of poor quality. Primitive herdsmen do not have the fine animals found on large modern ranches.

The nomadic herdsmen live in a simple way but not so simply as primitive fishermen and hunters. The herdsmen have a surer supply of food. They do not have to depend on hunting wild animals. They do depend, however, on the natural grasses which provide a living for their herds. This means that they also depend on the rainfall. When it is too dry for grass to grow in an area, these herdsmen must migrate. Some herdsmen in the world, you know, plant crops, such as hay and alfalfa, to feed their animals. They irrigate the land and grow these crops for winter feed. But few nomadic herdsmen have learned to grow feed for their herds. They are seldom able to raise more animals than they themselves need. They have few extra animals to sell for meat or hides. So they have little or nothing for trade. They have only the bare necessities of life.

PRIMITIVE FARMERS

Learning to plant seeds and raise crops has helped men to provide a better living for their families. At first men depended on wild plants. They gathered the seeds or roots or any parts that were good for food. Later they learned to plant seeds and cultivate the plants. Then they had better food and a surer food supply.

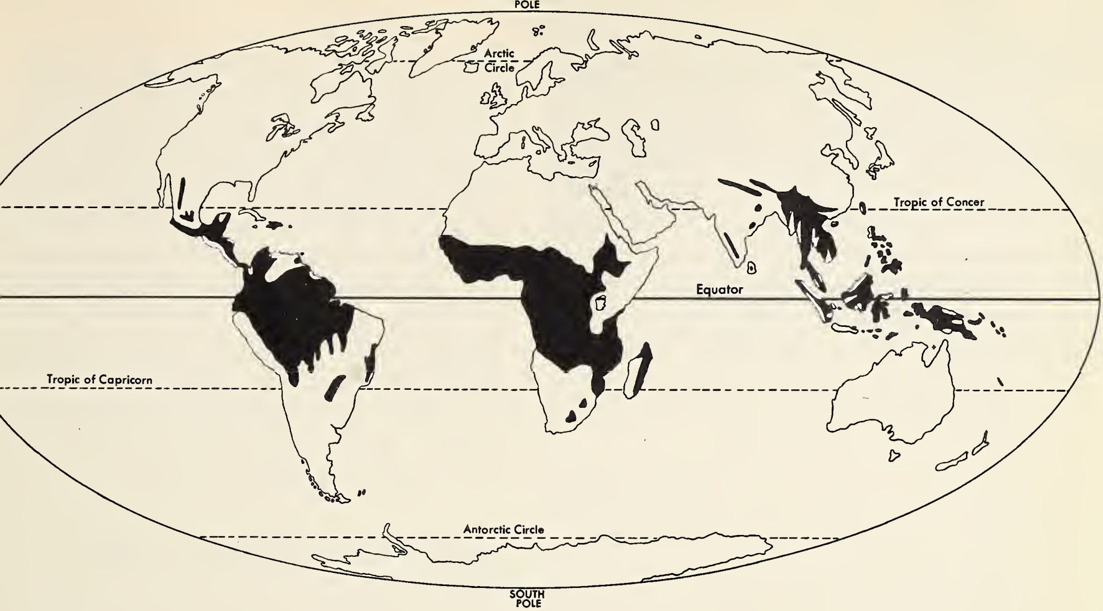
Primitive farming in South America. These Indians work hard for a bare living.

EWING GALLOWAY

Crops in early times. Certain grass-like plants which today provide many of our cereals grew wild in many parts of the world. Wheat was first cultivated in the southwestern part of Asia. It became the great grain food of the people of ancient Egypt. Rice was first raised in southeastern Asia and was the chief food of the ancient Chinese. The people of Europe learned about rice from merchants who traveled westward from China. Corn was discovered in the western hemisphere and was the grain food of the Indians living there. After the discovery of America, crops which had been raised in only one hemisphere were planted in the other also. Wheat, rice, and corn are widely raised in the world today.

Where primitive farms are found. Perhaps you have visited, or seen pictures of, a large farm where the owner raises huge crops of corn or wheat or vegetables to sell to other people. But primitive farms are very different from the large commercial farms. Primitive subsistence farmers, such as those you have read about, often till small scattered plots of land. They raise grain or vegetables in a tropical rain forest or on the edge of grasslands and bushlands. They use simple tools only.

You can see on the map on page 125 the regions in which primitive subsistence farmers live. These regions are mostly located within the tropics where the climate is warm and rains come often. Some of these farms are on warm lowlands. Some are in highlands, which, of course, are cooler. You can see too that primitive farmers live on many of



REGIONS OF PRIMITIVE SUBSISTENCE FARMING

the tropical islands of the world. The areas in which they live have thin population. In the world's dry lands only the oases are densely populated. Few of these areas are occupied by primitive farmers. In most such areas the farmers raise crops that they sell.

Migratory farming. In some of the tropical regions the farmers migrate after two or three years of raising crops. They travel to another place in the forest. There the older men of the tribe choose new plots of ground to be cultivated. When the dry season begins, the farmers clear away the vines and young trees, leaving only the large trees. As soon as the underbrush is dry, they burn it and partly burn the stumps and trees. Then nothing more is done to the soil until they plant their crops. The crops grow during the wet season. The Forest Indians of the Amazon, you know, farm in this way. They are migratory farmers.

In preparing the soil for planting, the farmers use sharpened sticks, spades, hoes, or even machetes. They have no farm machines. Some tribes do not cultivate the crops after they have been planted. Other tribes cut down the weeds once or twice. As the crops ripen, they must be protected from birds and animals.

Crops raised. Among the crops planted on the new farm plots are manioc, yams, peanuts, tomatoes, beans, peas, and bananas. In some places cotton and sugar cane are raised. In the western hemisphere corn is the most important of the grains grown by subsistence farmers, but in the eastern hemisphere *sorghum*, millet, and rice are important crops. Sorghum and millet grow on stalks like corn. They produce heads of grain which are used for food for men or animals. Stalks of sweet sorghum are pressed, like sugar cane, to make sirup.

Sometimes the farmers plant so that

crops ripen at different times. Then they have fresh food for a large part of the year. Sometimes they plant millet in rows on each side of potato plants, and then a higher crop such as corn. Crops planted in this way do not take much space, and less land has to be cleared.

Hard work for a bare living. Migratory farmers work hard for the food their families need. They have poor tools, poor seeds, and poor soils, and they must clear the land often. It is not easy to farm in a hot, rainy forest.

Between harvests the farmer hunts, fishes, and gathers food from wild trees. If the crops are not good, the men must depend mostly on hunting and fishing to provide food for the tribe. Such tribes get little, if any, food from outside the region where they live. Often it is difficult to transport goods to the region. These tribes usually live where there are no good land or water routes by which food can be brought to them.

Soon the farmers have used all the good land near their homes. They have to go farther and farther from the village to their fields. Sometimes in Africa herds of elephants trample the fields and the grass houses of a village. Though there are no wild elephants in the Americas, rats and insects may bother the people. So they decide to burn their huts. For these or other reasons primitive farmers often leave their village and build a new one. Because the regions having primitive farms are thinly populated, such farmers can always find new plots for their farms.

Not all primitive farmers migrate. Of course, there are some primitive farmers who do not migrate. Most of these farmers live in the tropical highlands and on the plateaus rather than on the lowlands. They stay in one place and grow crops on the same land year after year. They have a few simple tools made in other countries, which are better than the tools of the migratory farmers. They sometimes use fertilizer, and they often irrigate their lands. Many of these farmers keep cattle, horses, or other farm animals such as chickens and hogs. They build permanent homes for their families. Often they go to the village market to trade a few of their products for products of other regions. But like the migratory farmers they raise only subsistence crops.

SUBSISTENCE FARMERS OF THE ORIENT

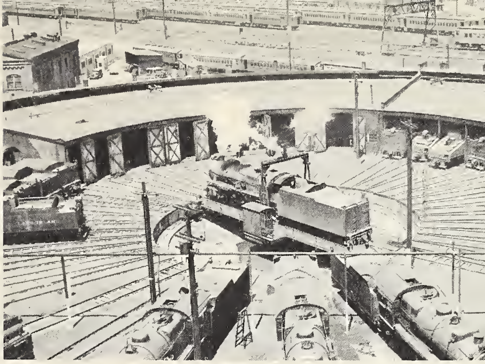
There are large numbers of subsistence farmers in the *Orient*. Before the days of Columbus travelers gave the name *Orient* to the lands of the far east. They did not know that they could reach these lands also by going west. The Orient includes the countries of eastern and southern Asia. Here more than half the people of the earth live. The entire western hemisphere has only about one fourth as many people as live in the *oriental* countries.

An oriental country of which you have heard is the large country of China. Two other oriental countries are India, which is in southern Asia, and Japan, an island country east of China. In these three crowded countries large numbers of the people are subsistence farmers. They live much like the Chinese rice farmers you have read about. They use the same methods of farming that have provided their food supply for hundreds of years. Their farms are so small that they are cultivated with hand tools. The farmers seldom have animals to help them do their work. Everything possible is done to produce large crops. These oriental farmers do not cultivate the poorer land as farmers can who use machines. As food they have mostly rice, millet, fruit, and vegetables. They raise chickens and ducks. They do not raise many cattle or sheep for food. Their land produces more food if it is used for garden crops than if it is used for pasture. They do not eat much meat, for they are too poor to buy it. They are just beginning to learn the value of milk.

MORE ABOUT WAYS OF LIVING

Living in a large city. Many of the people of the world live in ways which are very different from those you have read about so far in this book. In New York, the largest city in the United States, millions of people live close together. They have many occupations. But they do not hunt, fish, pasture animals, farm, or work in forests or mines for their living. They do not get the necessities of life directly from the earth. Almost every part of our country sends food and other materials for New York's people. Every day supplies are brought to the city by trucks, freight trains, ships, and airplanes. Materials are sent there from many different parts of the world. In New York City people work with these materials and get them ready to be sold. Others sell them to people in the city or ship them to be sold in distant as well as near-by markets.

A complex way of living. Primitive peoples live chiefly from their own lands, exchanging some of their extra goods with their neighbors. They depend on the region in which they live. But people like those in New York, who live in complex ways, do not produce their own food, clothing, and shelter. They work for money with which to buy the necessities of life. They do many different kinds of work and use machines in doing their work. With the money they make, they buy almost everything they themselves use. Therefore, they depend for their living on the products of many other peoples. By trade they obtain products not known to primitive tribes. They own more than the necessities of life.



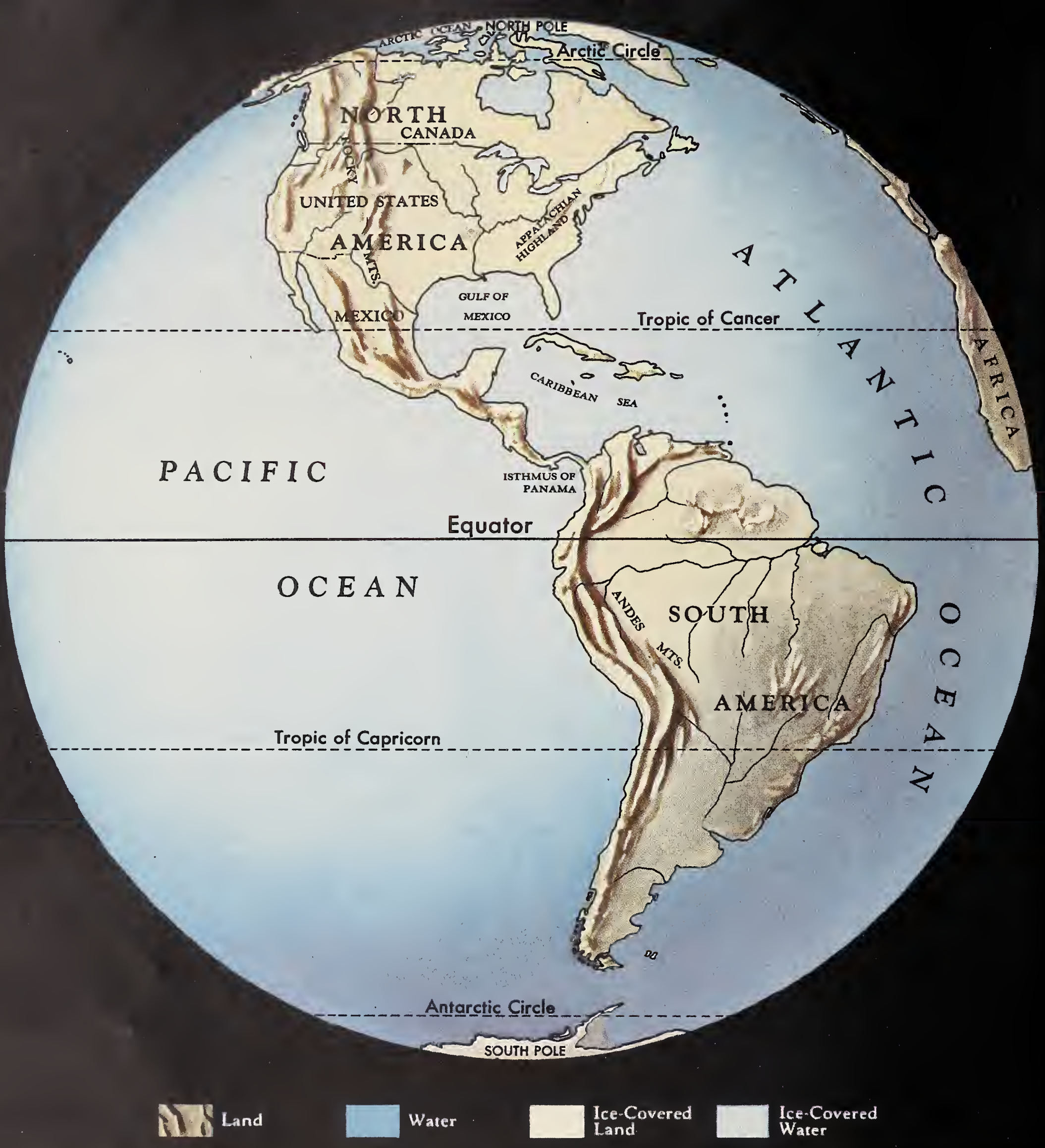
EWING GALLOWAY

Railroad yards in New York. Thousands of cars carry goods through these yards.

People who live in complex ways are less likely to be without food when their crops fail. Since they sell some of their own products, they have money to exchange for food from other regions.

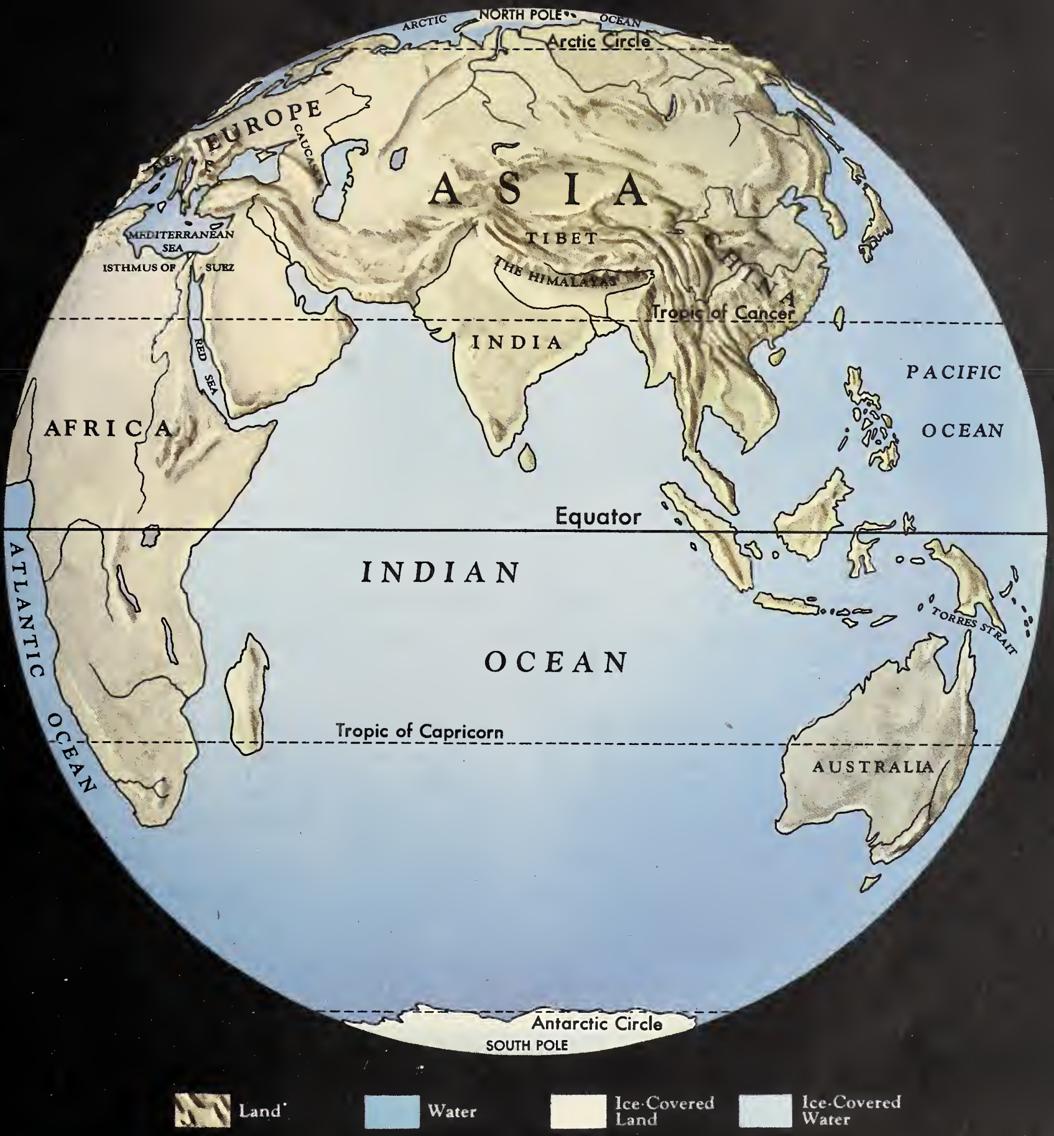
Primitive peoples no longer shut off from others. Until lately many primitive people were almost shut off from other people. They were visited only by those men and women who could make long ocean voyages or difficult overland trips. This helps to explain why primitive people did not learn new ways of working and playing and living. For hundreds of years people living primitively stayed much the same. They continued to get their food, clothing, and shelter by their own work from the region near their homes.

Today, however, many primitive groups of people are rapidly changing their ways



of living. Their lands are being visited by more and more people from other parts of the world. Thus, many primitive tribes are learning about the complex ways in which others live. They are slowly changing from old to new ways of life.

Our living comes from the earth. All people, wherever they live, must get the necessities of life from the earth. Some obtain these directly from the earth, as do primitive peoples. Others get them by trade, as do people who live in complex ways. But whether people produce the things they use or buy them from someone else, food, clothing, and shelter always come from the earth.



THE CONTINENTS AND OCEANS

You have been reading about peoples who live on continents and on islands. Next you will read about the different kinds of land which people use and the kinds which are used little, if at all. You will also read about the oceans.

Look at the two globes on these two pages. See the great area covered by the oceans. The seven continents together with all the islands in the world form only about one fourth of the earth's surface. The other three fourths is water separating the continents.

Let us think of Europe and Asia as one

EWING GALLOWAY

The snow-covered peaks of the Himalayas reach high above the clouds. This picture was taken in India. On the other side of the mountains is cold Tibet.

continent. Then the continents are really large islands. Ships can sail around every continent. The oceans are great world highways. In the Arctic Ocean, however, floating ice slows down travel by ship or stops it entirely.

Land and water in the eastern hemisphere. Notice that the land surface of the eastern hemisphere is broken almost in two by seas. These seas are the Mediterranean Sea and the Red Sea. A low sandy neck of land connects Africa and Asia. A narrow neck of land joining two larger bodies of land is called an *isthmus*. This isthmus is named the Isthmus of Suez. About eighty years ago a Frenchman dug a large canal through the Isthmus of Suez. The Suez Canal is a little more than one hundred miles long. Notice that the voyage from western Europe to India is much shorter now than it was before the canal was dug.

Find Australia. Notice the narrow strip of water lying between Australia and the islands to the north. This strip connects the Indian Ocean and the Pacific Ocean. Such a strip of water connecting two larger bodies of water is called a *strait*. This strait is named Torres Strait.

Land and water in the western hemisphere. The land surface of the western hemisphere also is broken almost in two in the same way. It is broken mainly by the Gulf of Mexico and the Caribbean Sea. Americans finished this break by digging a canal through the Isthmus of Panama. On the globe on page 128 find this isthmus between North America and South America. Notice the land around the Gulf of Mexico. A *gulf* is a large body of water extending into the land.

MOUNTAINS AND PLATEAUS

The Himalayas and Tibet. From the globes on pages 128 and 129 you can see that on the continents there are chains of mountains, some higher than others. The highest mountains in the world, the Himalayas, lie north of India. See these mountains on the globe on page 129. North of them is a high, arid plateau, Tibet. This plateau is thinly settled and so hard to reach that few white men have seen it.

The Caucasus. The highest mountain peaks in Europe are in the Caucasus. The region around the Caucasus is also thinly settled. Until oil was discovered in this region, few travelers from other parts of the world went there.

The Alps. Unlike the Himalayas and the Caucasus, the Alps in central Europe are in the middle of a thickly settled region. People much like ourselves have seen them and crossed them and lived among them for many hundreds of years. The highest peaks are so high that not even grass can grow on them. More snow falls in winter than can melt in summer. In the valleys between the mountains are many lakes. Several of them are from ten to thirty miles long. Steamers carry visitors from town to town along the shores of these lakes. In this beautiful region are many hotels for visitors from other parts of Europe and from America.

You would enjoy a summer visit to see the Alps in Switzerland. You could take an automobile trip to the foot of a *glacier*. Here you would see a river of solid ice hundreds of feet deep reaching down into a valley from the snowy slopes above. Very slowly, sometimes only a few feet each year, the glacier moves through the valley. It tears out a deep path for itself and carries great rocks along with it toward the lower valleys. There it melts into streams of water. These streams help to form the great rivers that have their sources in the Alps.

Mountain ranges in North America. In the eastern part of the United States low mountains and hills run from southwest to northeast. In the western part of the continent high mountains run from southeast to northwest.

Most of the low mountains in the eastern part of North America are long, gently sloping ranges. Together they are called the Appalachian Highland. In the western part of North America most of the mountains are in high ranges. Many of these western ranges are higher than any peaks in the eastern part of the continent. The longest of the western ranges is called the Rocky Mountains. There are other shorter ranges between the Rocky Mountains and the Pacific Ocean.

The mountains of eastern United States are mostly forested. Very few of these mountains reach more than a mile higher than the level of the sea. Most of them are much lower than that. It is colder, you remember, at the top of a mountain than at the bottom, and the winter snows last longer. These eastern mountains are not high enough to have snow on their

EWING GALLOWAY

From the tops of the Alps in Switzerland, glaciers like this one move slowly down through the valleys. Water melting from these glaciers forms deep, beautiful lakes.

NYSPIX COMMERCE AND BURTON HOLMES

Mountain ranges in North America. The left-hand picture shows hills and low mountains of the Appalachian Highland. On the right are two high, rugged peaks of the Rocky Mountains.

peaks all summer long. Small trees or grass grow on the tops of all these mountains.

The highest peak in North America is in Alaska. There are other peaks nearly as high in northwestern Canada and in Mexico, the country just south of the United States. Many of these peaks are at least twice as high as the highest peaks in the east. Most of the high peaks have snow on their tops the year round. Not even grass can grow there. But on the lower slopes of these peaks there are usually forests. On the slopes of some of our western mountain ranges grow the largest trees in the world.

The Andes. In South America are the great Andes ranges. When seen from ships at sea, these mountains seem to rise out of the Pacific Ocean. They are higher than any other mountains in the world except those in and around the plateau of Tibet in central Asia.

THE CLIMATE OF DIFFERENT LANDS

The kind of weather any region has year after year is called its *climate.* When one tells about the climate of a region, he tells of heat or cold, of much or little rainfall, of clear or cloudy skies, and of windy or calm weather.

The ocean and climate. You remember that the ocean covers about three fourths of the earth's surface. Especially in the southern hemisphere there are great stretches of water.

The climate of the ocean is very different from that of the land. In summer the ocean is colder than the neighboring land. In winter, however, it is much warmer. Let us see why.

On a clear summer morning you have felt the air get warmer as the sun climbed higher and higher in the sky. The hottest time of the day comes in the afternoon. During the day the sun warms both the land and the ocean. But open water does not heat up so rapidly as land. After sunset you have felt the air grow cooler. Then the land cools off fast, but the water cools off much more slowly.

In summer the inner parts of the continents get very hot. These areas are far from the ocean. But near the ocean — on the seashore or on islands — the summers are cooler than they are inland. The summers in regions near the ocean are cooler because the ocean remains cooler.

Air moves from places which are cooler to places which are warmer. On summer days near the ocean or near a large lake, a cool wind springs up, blowing from the cool water onto the warm land. When the cool wind blows over the land, the air for some distance inland is cooled suddenly.

In winter just the opposite happens. The land cools off very fast, while the water cools off more slowly. The air over the water is not so cold in winter as the air over the land. Places near the water have milder winters than places far inland.

The meaning of latitude. As you go from the equator toward the poles, the climate grows colder. Therefore, if you want to study the climate of a region, you should know the *latitude* of the region.

Latitude means distance north or south of the equator. Places the same distance north of the equator are in the same north latitude. With the help of a string and your globe find a city in North America that is the same distance north of the equator as the mouth of the Yangtze River. These places are in the same north latitude.

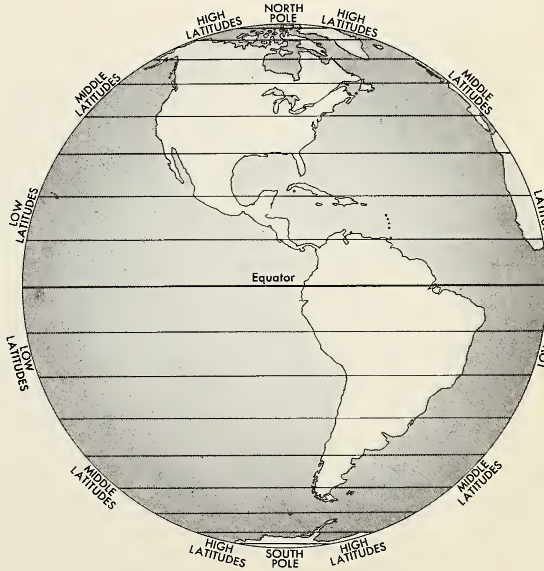
On your globe find two places south of the equator that are the same distance from the equator. On what continents are they? They are in the same south latitude. All places south of the equator are in south latitude.

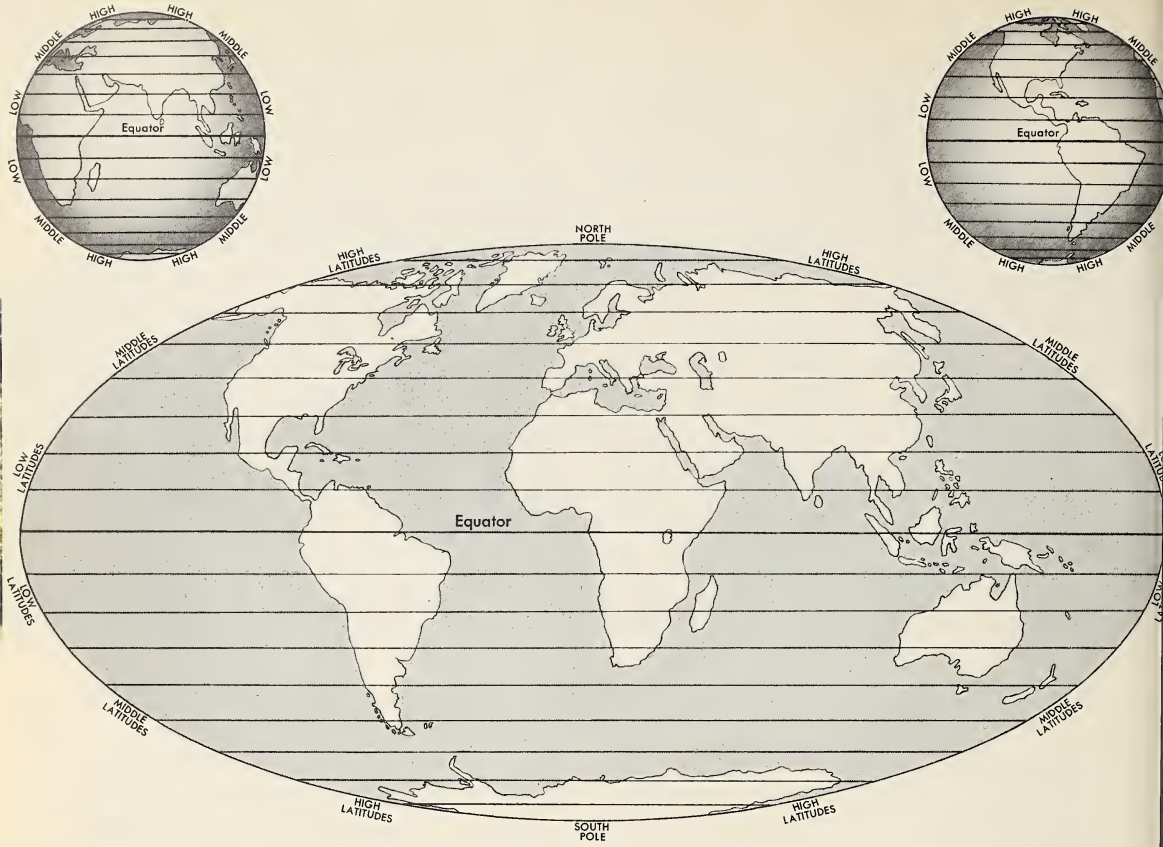
East-and-west lines. Next look at the globe on this page. The equator is shown as an east-and-west line going around the earth halfway between the poles. You know, of course, that a hoop is round. If you lay a hoop flat on a table and look at it with your eye at the height of the table top, one side of the hoop looks like a straight line. That is why the equator, which is really a circle, looks like a straight line on this globe.

Notice that on this globe there are also other east-and-west lines. You will find such lines also on some maps. These lines too are circles going around the globe. They get smaller and smaller as you go from the equator toward the poles.

All places on an east-and-west line are the same distance north or south of the equator. They therefore are in the same latitude. For this reason we call these lines *lines of latitude*.

Low, middle, and high latitudes. We





speak of *low latitudes*, *middle latitudes*, and *high latitudes*. On both sides of the equator the low latitudes extend about a third of the way from the equator to the pole. The high latitudes are those nearest the poles. Between the low and the high latitudes are the middle latitudes.

The places in the lowest latitude of all are on the equator. The places in the highest latitudes are at the poles. You can go no farther north from the equator than to the north pole, no farther south from the equator than to the south pole.

Both the eastern and the western hemispheres have low, middle, and high latitudes, as you can see on the map on this page. Always use a map or globe to find a new place when it is first named. Notice whether the place is north or south of the equator. See whether it is near the equator and therefore in the low latitudes, far from the equator and therefore in the high latitudes, or in the middle latitudes in between. Notice whether it is in the western hemisphere or in the eastern hemisphere. If you get into the habit of noticing these simple things, your study of geography will be very interesting.

In the low latitudes. In the low latitudes the noontime sun is never low in the sky. Therefore the land does not get very cold in winter. Tropical climates have much the same temperatures the year around. There really are no winters as we know them. The temperature of the ocean is not usually very different from the temperature of the land, because the differences between the cold and warm seasons are so small.

Lands with a warm climate can be made to produce crops that cannot be grown at all where there are frosts. Think, for example, of dates grown in the Nile Valley. Neither the Eskimos nor the Reindeer People can raise dates, because this fruit will not grow in a cold climate.

In the deserts in, or near, the low latitudes are found the highest temperatures in the world. During the summer the temperatures are very high except in areas close to the ocean or on high mountains. It is so hot in the afternoon hours that travel is very uncomfortable. At night the temperature usually drops rapidly under the clear sky. If you went to the Sahara, you might find the days very hot and the nights freezing cold.

In the high latitudes. In the far north where the Eskimos live, it is cold. Near the south pole, as you have learned, the land is always covered with ice. Besides the tops of high mountains there are two parts of the land surface of the earth where there is no summer at all. One is the Antarctic Continent. The other is the inner part of Greenland. Both these lands are covered with ice hundreds of feet thick.

In the middle latitudes. Between the cold lands and the warm lands, most regions have a climate that is either cold part of the year and warm part of the year, or neither cold nor hot the year round. By far the largest part of the farm land of the earth is on the plains in the middle latitudes. These plains have both summer and winter each year. As you go toward the low latitudes, winters are

A forest in the low latitudes. This picture might have been taken at any season of the year. Snow never falls on this forest, and most of the trees are green all year round.

CHARLES PERRY WEIMER

PHOTOGRAPHER WILSE, NORWEGIAN GOVT. RAILWAYS, AND PHILIP GENDREAU, N. Y.

Two very different regions of Europe in winter. On the left is Norway, in the higher middle latitudes. On the right is a Mediterranean seashore, in the lower middle latitudes.

shorter. As you go toward the poles, the winters are longer. But the summers in the inner parts of the large continents of the middle latitudes are very hot. They are hotter than any season of the year in the low latitudes.

Warm and cool climates in the middle latitudes. The part of the middle latitudes nearest the low latitudes is sometimes called the *lower middle latitudes.* Also, the part of the middle latitudes nearest the high latitudes is called the *higher middle latitudes.* In the northern hemisphere the higher middle latitudes are much closer to the north pole than are the lower middle latitudes. In the southern hemisphere the higher middle latitudes are much closer to the south pole. This means that there are great differences between climates within the middle latitudes.

Almost all the United States lies in the middle latitudes. Of course, the most southern part lies in the low latitudes. But most of southern United States is in the lower middle latitudes. Here the winters are short. In only two or three months of the year are there frosts severe enough to kill crops. Here many vegetables and berries ripen in March instead of June or later as in the northern part of the United States.

The climate in the higher middle latitudes, where most of Canada lies, is very different from that in the lower middle latitudes. In the higher middle latitudes there are frosts in almost every month. Only hardy crops can be grown. The people of Canada raise wheat as far north

Summers in the middle latitudes are often very hot, and the winters very cold. These pictures were taken in the United States about half way from the equator to the North Pole.

PHILIP GENDREAU, N. Y.

as they can. But it has to have three months without frost. Barley, hay, and potatoes are the crops that can be grown farthest north.

Much of Europe lies in the middle latitudes. And like North America, Europe extends also into the high latitudes. The north of Europe is cold in winter. But the lands around the Mediterranean Sea have mild winters. Northern Europeans escape the cold weather by visiting the coast of the Mediterranean Sea. Many Americans cross the Atlantic to spend the winter there. Mediterranean lands send fruits and vegetables to northern Europe in winter.

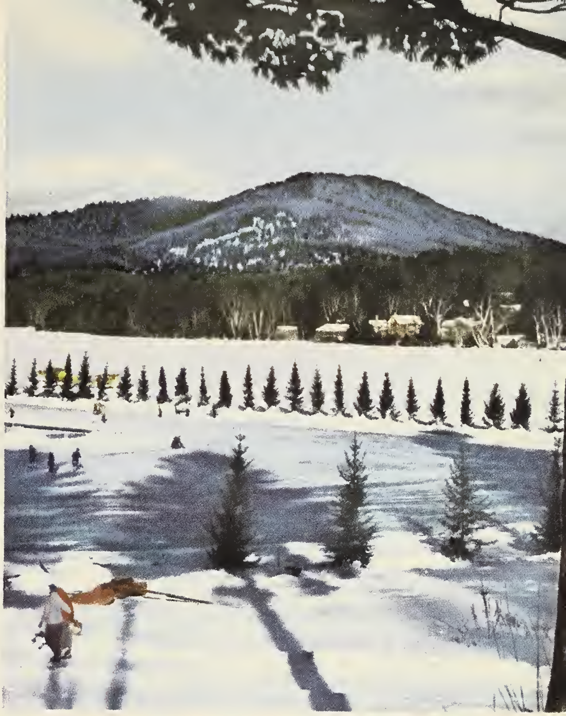
The climate of Asia is very warm in the south and very cold in the north. Can you explain why?

Seasons in the northern and southern hemispheres. In the southern hemisphere the seasons are opposite to ours. This means, of course, that when the northern hemisphere is having summer, the southern hemisphere is having winter. When one has autumn, the other has spring.

In South Africa and Australia and the parts of South America that are south of the equator, the shortest days come in June. The longest days come in December. July is likely to be a cold month and January a warm one.

On farms south of the Tropic of Capricorn the noonday sun is in the northern sky. The crops are harvested from November to February. In July there may be snow. Even some of the stars in the night sky are different from those seen in the northern hemisphere.

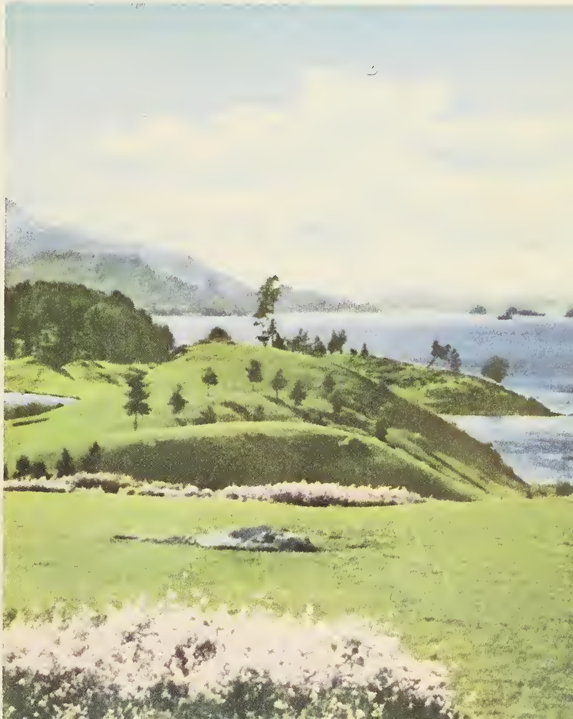
Shadows show the height of the sun. If you have ever studied your shadow, you know that it is shorter at noon than in the early morning or late afternoon. You



NYSPIX COMMERCE

These two pictures show lands of the northern and southern middle latitudes in December. Which was taken in the southern middle latitudes? How do you know?

CHARLES PERRY WEIMER



know too that it is shorter in summer at noon than in winter at noon. If you live north of the Tropic of Cancer, your noontime shadow always points north.

Before the days of airplanes, people sometimes sailed from eastern United States all the way around South America. Pretend that you are taking such a trip. Day after day the sun is higher in the southern sky. Your shadow at noon becomes shorter and shorter. Then one day at noon the sun is directly overhead. You are now standing right in the middle of your own shadow. It has shrunk until it is as small as it can be. You are now somewhere in the low latitudes where it is always warm.

Just where you are depends on the time of year. On about June 21 you could stand in the middle of your shadow if you were at the Tropic of Cancer. On about September 22 you would have to be at the equator. On about December 22 the sun is directly overhead at the Tropic of Capricorn, and on about March 21 at the equator again. On other dates you would have to be at some point between the Tropic of Cancer and the Tropic of Capricorn if you wanted to see the noontime sun right over your head.

Shadows in the southern hemisphere. Now suppose you sail south into the southern hemisphere. Soon the sun is not quite so high at noon. It is behind you in the northern sky. Your noontime shadow points south and is longer each day.

Slowly the weather becomes cooler, but not much cooler. You are visiting the southern hemisphere in its summer. That, of course, is our winter. Then you sail around the southern tip of South America. Where is your noontime shadow now? What happens to it as you travel northward toward the Tropic of Capricorn?

NATURAL VEGETATION

The plants that grow in a region are called the *vegetation* of that region. *Natural vegetation* is the vegetation that grows wild without having been planted. Only the coldest and the driest regions of the earth are entirely without vegetation.

Areas where the rainfall is light or where the weather is always cold are but thinly covered with vegetation. But regions of heavy rainfall are covered with forests. The forests of a hot land are much thicker than those of cooler regions. There is a great deal of vegetation in tropical rain forests.

A vegetation map. On pages 140 and 141 is a map of the natural vegetation of the world. It shows you how the world was divided into forests, grasslands, deserts, and tundras, before men cut down the trees, plowed the grasslands, and watered some of the deserts. Notice the key of this map. One shading means that the land is mostly covered with forests. Another means grasslands. Still another means deserts. What shading means land that is always covered with ice? What shading means tundras?

The deserts. See how many deserts you can find on this map. Which two deserts have you read about? The largest desert in the world begins in northwest Africa at the Atlantic coast. It reaches all the way across northern Africa and central Asia to northeast China, nearly halfway around the world. In Africa, you know, it is called the Sahara. But east of the Red Sea it is named the Arabian Desert. Next it passes through southwest Asia and into North China, where it is called the Gobi Desert. Now look at the map and see Africa, Europe, and Asia as one large continent rather

EWING GALLOWAY, AND WATSON FROM MONKMEYER

The first picture shows a cone-bearing tree. The second shows a broadleaf tree. Do you have both kinds of trees near your home? Do you have more of one kind than the other?

than three separate ones. Then the largest desert in the world crosses the largest continent in the world.

In most deserts there is a long time between rains, perhaps years. When rain does fall, it is likely to be a heavy downpour which may last several hours. In all deserts the hills and mountains receive more rain than the level land receives.

Very few areas in a desert have no vegetation. Even the great sandy deserts have small bushes in the hollows between the dunes. Wherever there is moisture near the surface, there are plants. Desert plants usually grow some distance apart, you will remember.

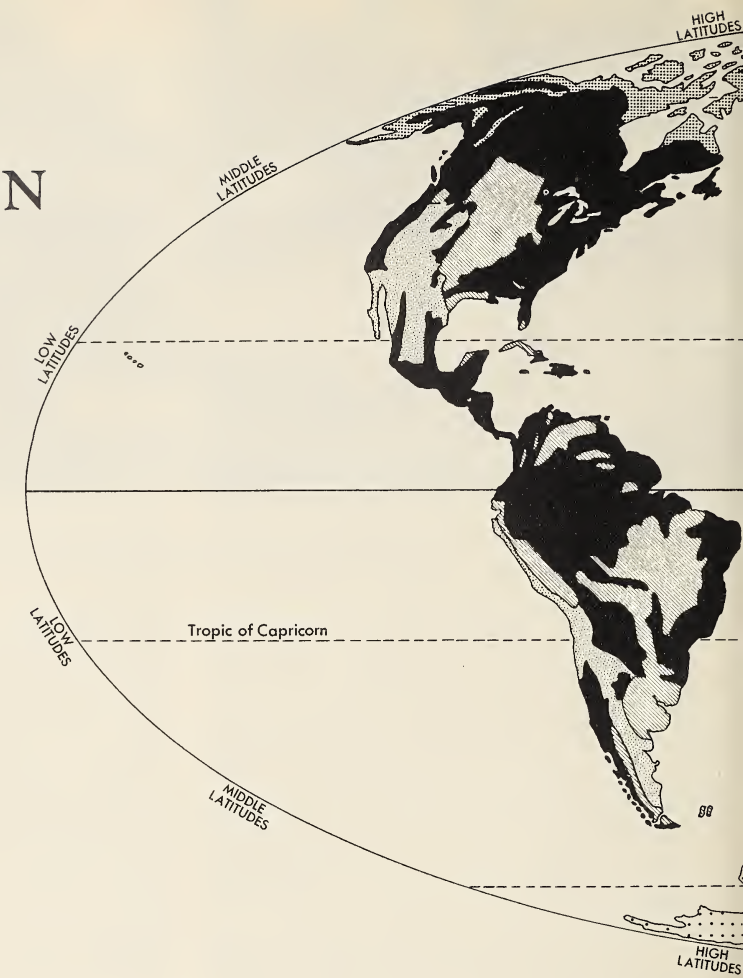
The forests. On the vegetation map see where there are forest lands. There are many forests in the world. The trees in these forests are of two main kinds. One kind of tree bears cones and has leaves like needles. Such trees are called *cone-bearing* trees. They include the pine, the fir, and the spruce, which you may have seen. Most cone-bearing trees stay green all year. People sometimes speak of them as *evergreens*. But not all of them are, for some drop their leaves in the autumn. One of these is the *larch*, a member of the pine family.

The other kind of tree has broad leaves that are not at all like the needles of the cone-bearing trees. The leaves on many of these trees are quite large, but other trees have many tiny leaves on one branch. The *broadleaf* trees, such as the oak, maple, and elm, do not bear cones. Some broadleaf trees lose their leaves in the fall. Others, such as the palm tree, are evergreens.

Forest regions in North America. There are forests only where there is plenty of moisture in the soil. Along the western coast of North America, as the map on page 140 shows, there are forests near the mountains or on mountain slopes. Most of the trees here are cone-bearing trees.

Another great forest region in North America stretches all the way across central Canada from the Pacific Ocean

WORLD NATURAL VEGETATION

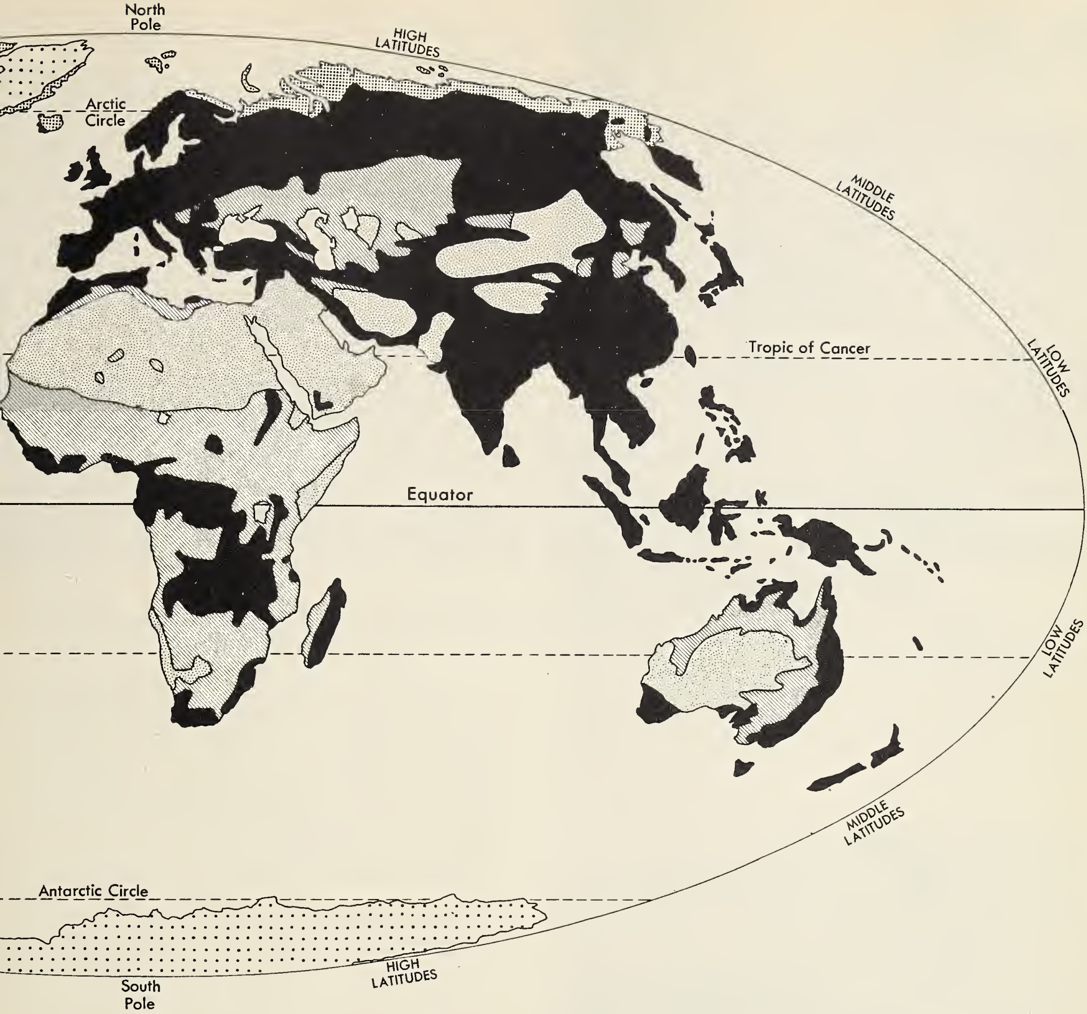


to the Atlantic. Find this region on the vegetation map. This, like our Pacific coast, is a region of cone-bearing trees.

Near the western coast of the United States, as we have seen, the trees grow tall and large. There the weather is mild the year round, and the rainfall is heavy. East of the mountains near our west coast most of the trees are smaller. In this region the winters are colder, and less rain falls.

There are other important forest regions in the United States. One is just north of the Gulf of Mexico. Here there are both cone-bearing and broadleaf trees. The trees in these southern forests grow on low, smooth plains, or rolling land instead of high, rough mountains.

A forest across Eurasia. On the vegetation map find a long *peninsula* in northwestern Europe. A peninsula is an area of land that extends out into a body of water. Peninsulas are usually almost surrounded by water. A very large forest begins on this peninsula and stretches eastward all the way across northern Europe and northern Asia to the Pacific Ocean.

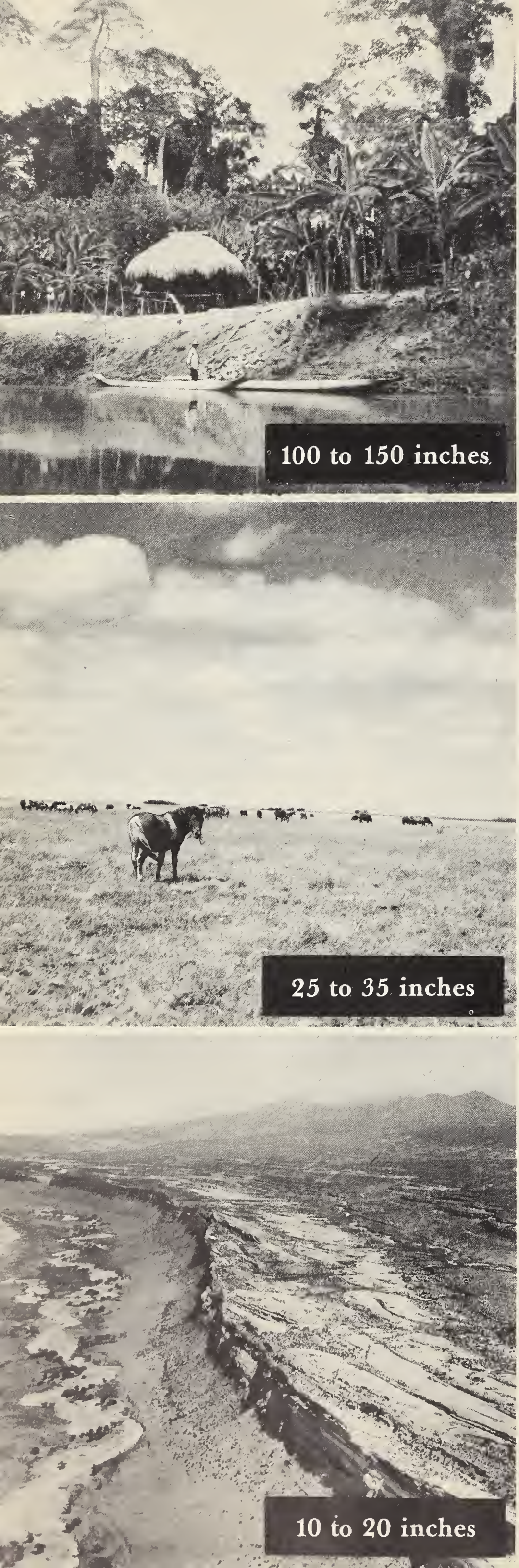


The trees are mostly cone-bearing trees.

Tropical rain forests. Find on the vegetation map two large forests that are near the equator. These are tropical rain forests. The Amazon flows through the forest in South America and the Congo through the forest in Africa.

In these forests are many kinds of trees with broad leaves. The tropical rain forests along the upper Congo River are much like those of South America. In the depths of these African forests live tribes of primitive people like the Forest Indians. But the dark-skinned natives that live along the Congo are Negroes, not Indians, as in South America.

The grasslands. About one fifth of the land surface of the earth has a natural cover of grass. These grasslands are usually between the deserts and the forests. The grass does not grow in bunches with bare ground between the plants as on a desert. Instead the grass covers the ground. There are few trees on the grasslands, because there is not enough water for many trees. The land



CHARLES PERRY WEIMER AND EWING GALLOWAY

These three pictures show forest, grassland, and desert regions in the western hemisphere. The rainfall for each place is printed on the picture. The forest shown is in the low latitudes, the grassland and the desert are in the middle latitudes. You should be able to explain why the vegetation is so different in these three places.

can be used for pasture and for hardy crops which do not need much water.

Nomads on the grasslands. Nomadic peoples pasture sheep and goats on the grasslands of North Africa and Eurasia. In a few parts of these grasslands cattle, horses, or camels are raised. You will remember that from his herds the nomad gets material for his clothing, his house, and his tools. Also he gets meat and milk from his herds. The grass depends on the scattered showers. When the nomad hears of rain in an area, he moves his animals there. To the nomad rainy years mean years of plenty.

Until about a hundred years ago few white people used the grasslands. In North America, when the settlers reached the *prairies*, they stopped. A prairie is a grassland in which the ground is thickly covered with tall grass, sometimes several feet in height. The settlers chose to build their homes on the edge of a forest. For a long time only hunters who followed wild game were found on the grassy plains. Later when men wanted to raise large herds of cattle or flocks of sheep, the grasslands were used as pasture.

Farming on the grasslands. Today we have plows that make it easy to cut and turn the thick mat of grass roots and soil which we call *sod*. We have machines for digging wells to get water. So large numbers of farmers have moved onto the

PHILIP GENDREAU AND CATERPILLAR TRACTOR CO.

Farming grasslands by machine. By using machines on level or gently rolling land, farmers can cultivate much more land and harvest larger crops than they could without machines.

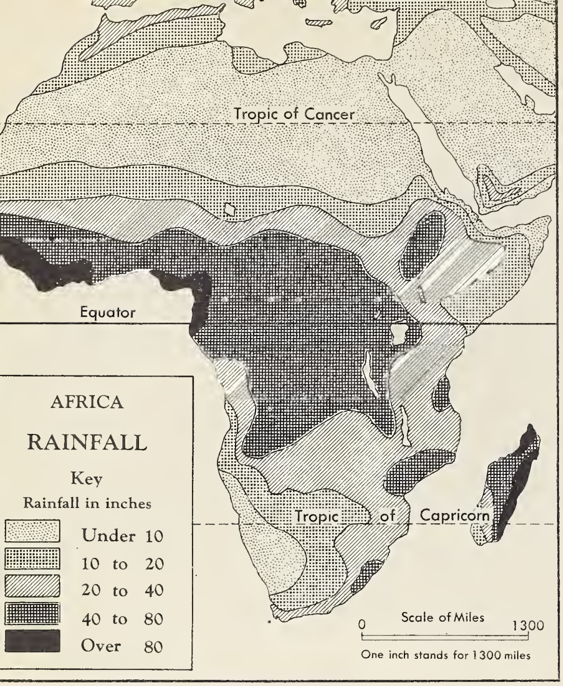
grasslands. They produce quantities of corn, wheat, and meat animals. Much of this food is used in the cities. Many such farms are cultivated in countries where people live in complex ways.

However, grassland has to be farmed carefully if it is to continue to produce crops. Some areas are too dry to be farmed every year without irrigation. But if the fields are left unplanted for a year, grass will cover the ground again. The grass roots will hold moisture in the soil. Then when the land is plowed, it will produce good crops. Sometimes after the grass cover has been plowed under, there is a very dry season. No rain may fall for a whole year or even two or three years. The soil is very dry. If strong winds come, they will blow the fertile topsoil away. The dust storm may last for days. It may carry away so much soil that the land will not produce grass even when rains come again. But people are learning to use grassland to produce crops without harming the land. Then by selling their crops they obtain money with which to buy things they need or want.

HOW TO STUDY MAPS

Black-and-white maps. In this book you have seen maps in black and white and maps in colors. Some black-and-white maps show parts of the world in solid black and the rest in white. Black may be used, as on page 121, to show where primitive fishermen and hunters live. Land areas where they do not live are left white on the map. Other black-and-white maps use different kinds of shading to tell about different things. The maps on page 80 and page 116 each use five kinds of shading. You can tell what each kind means by reading the map key.

Remember that black, or any kind of shading, does not always mean the same thing. On the map on page 80 black means the most rainfall. On the map on page 116 black means the areas where people live closest together.



The map on this page shows you how the rainfall of a continent can be shown in black and white. What continent is shown on this map? How many kinds of shading are used, and what does each mean? About where is the Sahara? How much rainfall does most of the Sahara have? We can also show the rainfall of a continent by using colors. Compare this map with map 1 on page 145. What color on map 1 means the same thing as black on this map? What color on map 1 means the driest areas?

Color keys. Colors on maps mean different things. You should always be sure that you know the meaning of each color on a map that you are studying. Look at the four maps of Africa on page 145. On each of these maps the colors have a different meaning. Study the key of map 1. What does yellow stand for on this map? What does this same color stand for on map 2? Map 3?

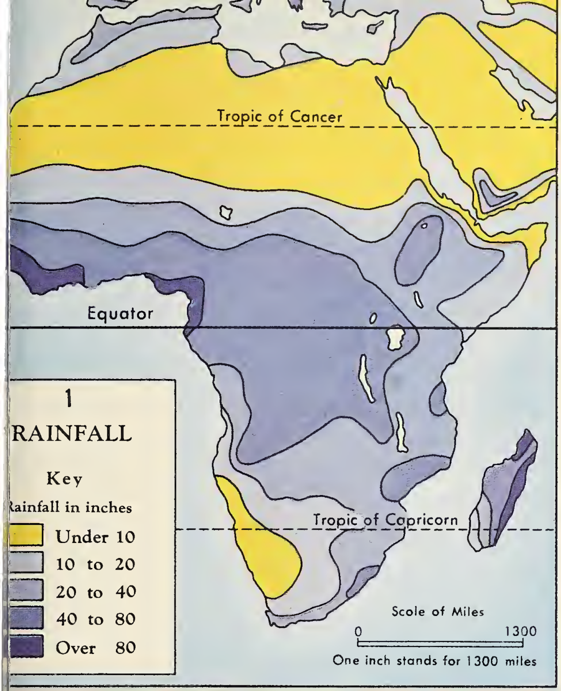
Sometimes it is important to know whether the land is almost bare or is covered with grass or forests. Map 2 is a vegetation map. On this map blue means water. But dark green means forests and light green means grasslands. You can learn what each color means by reading the key of the map carefully. You must always remember to do so.

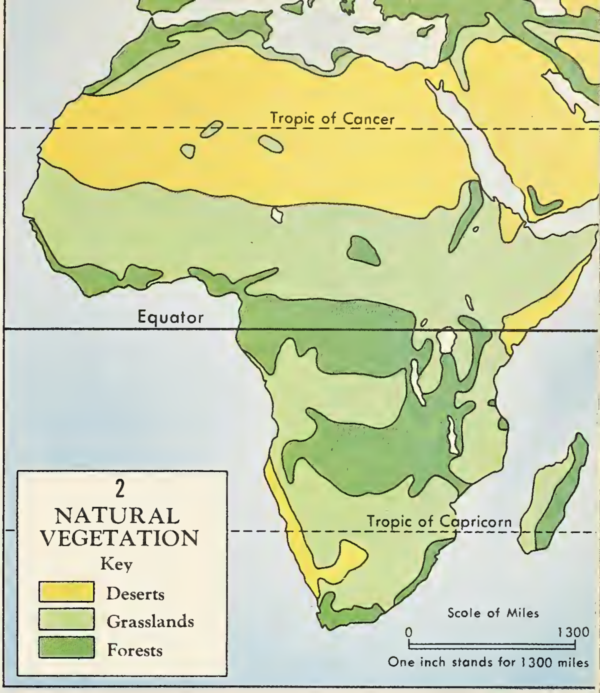
Map 3 shows you where there are mountains, hills, plateaus, and plains, and whether the land is level or rough. Red means very rough land crossed by mountains. Brown means hilly lands. Yellow means high tablelands, or plateaus. Green means low level land, or plains. Of course, blue means water.

On some maps each country is shown in a separate color so that you can see easily where one ends and another begins. Map 4 is such a map. It does not show whether the land is high or low, moist or dry. But it does show, better than any other kind of map could, where each country is. What color is Egypt?

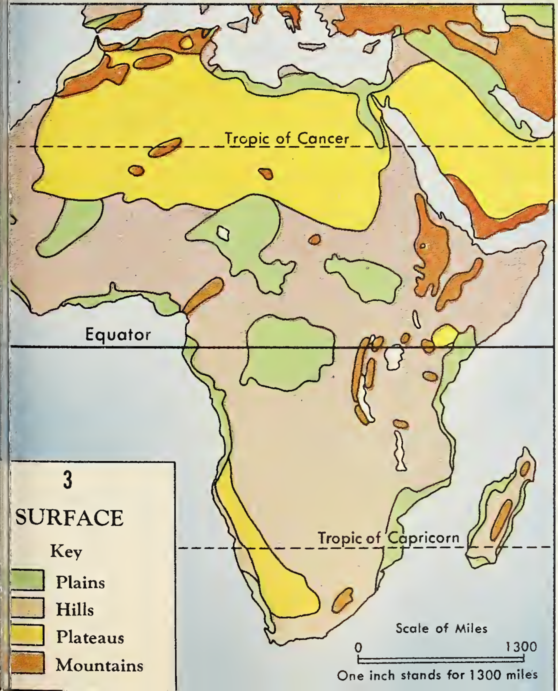
States and provinces. Our country, the United States, is divided into forty-eight parts called *states*. Not all countries are so divided. The main part of China is divided into twenty-eight smaller parts called *provinces*. There are other much larger parts west and north of the main part of China. Here some of the people are Chinese, some are Russians, and it is hard to tell to which country these great areas of land really belong.

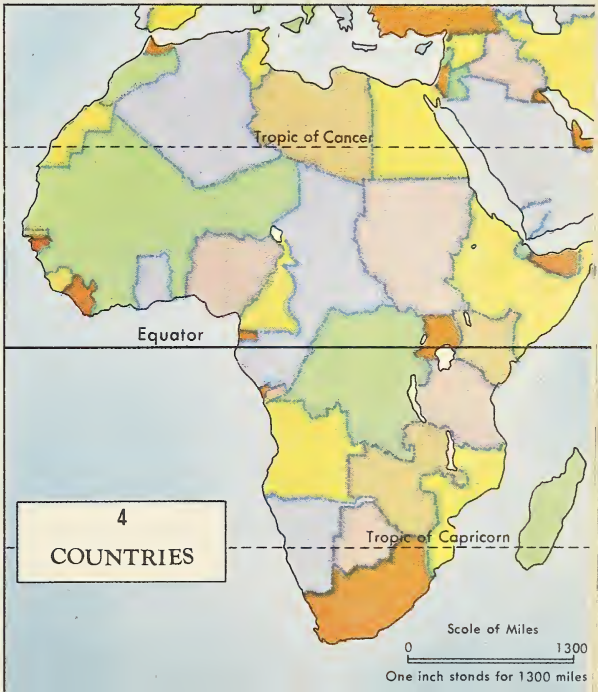
Whenever a state or a province is named in this book, you should find it on a map. Each state or province may be in many ways like those next to it. But using its name makes it easy for us to tell what part of the country we are talking about. You remember reading about the Chinese rice farmers who live

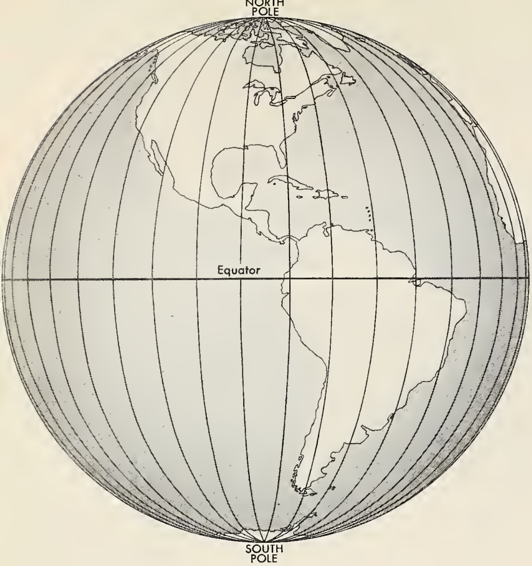

Tropic of Cancer
Equator
Tropic of Capricorn
1
RAINFALL
Key
ainfall in inches
Under 10
10 to 20
20 to 40
40 to 80
Over 80
Scole of Miles
0
1300
One inch stands for 1300 miles


Tropic of Cancer
Equator
Tropic of Capricorn
2
NATURAL VEGETATION
Key
Deserts
Grasslands
Forests
Scole of Miles
0
1300
One inch stands for 1300 miles

AFRICA


Tropic of Cancer
Equator
Tropic of Capricorn
3
SURFACE
Key
Plains
Hills
Plateaus
Mountains
Scale of Miles
0
1300
One inch stands for 1300 miles


Tropic of Cancer
Equator
Tropic of Capricorn
4
COUNTRIES
Scale of Miles
0
1300
One inch stands for 1300 miles



in a village in the east central part of China. When you learn that their village is in the province of Kiangsu, it is easy to find that part of China on the map. It is much easier to say "Kiangsu" than "the east central part of China."

Rivers on maps. A river is shown on a map by a crooked line, which follows the bends of the river all the way to its mouth. Lines for rivers are usually in black, but on some maps you may find them in blue. Thinner lines joining a thicker line stand for the smaller streams flowing into the river. Water always moves downstream from the source of the river to its mouth. Rivers always flow toward lower elevations. Find an elevation map earlier in this book and show that this is true.

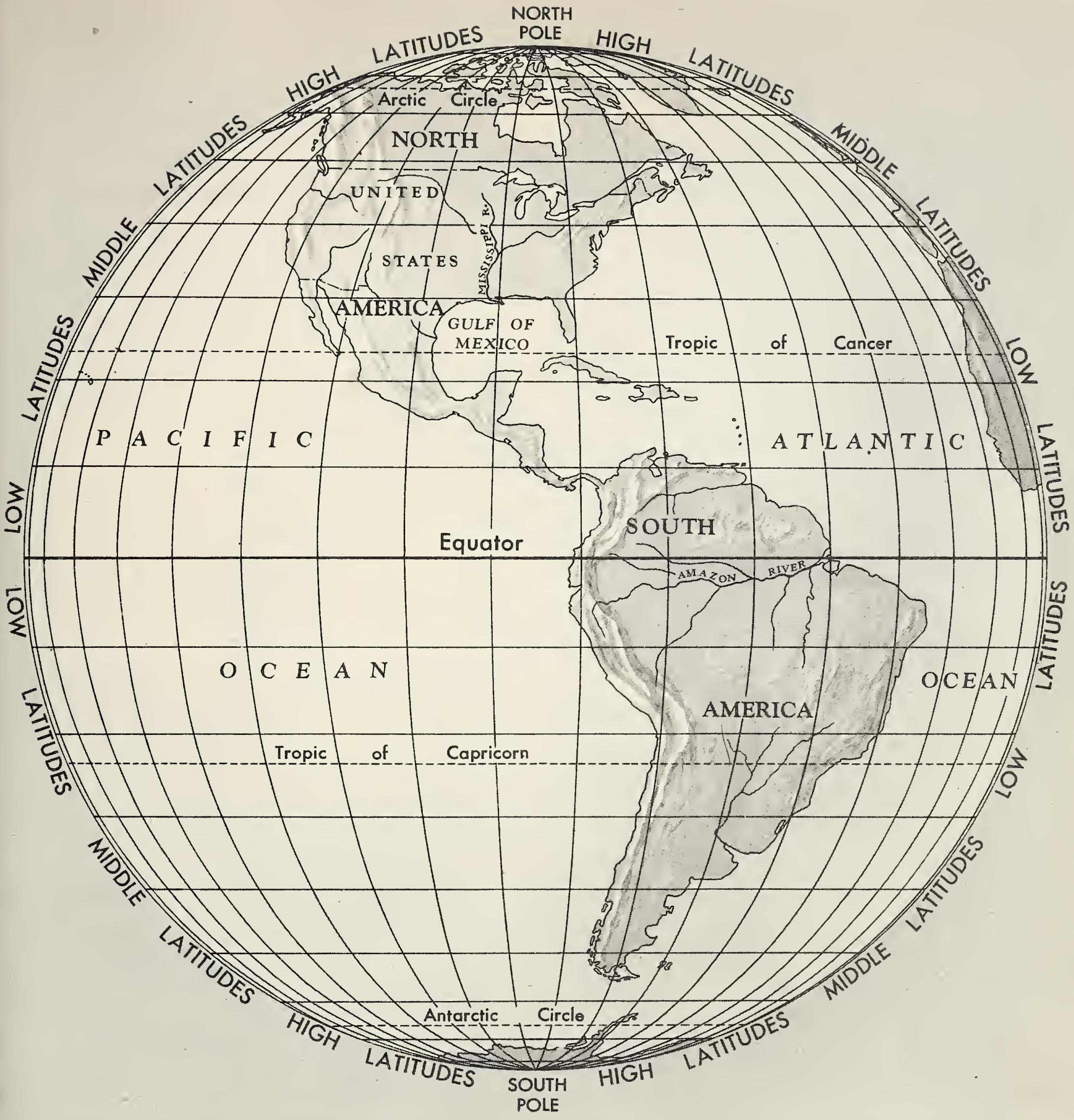
The scale of miles. You know that some maps have a larger scale than others. On a large-scale map any area is larger than it can be shown on a small-scale map. On a large-scale map a city may take up a whole page. But on a small-scale map a city is usually squeezed into a little round dot. Mountains, lakes, and rivers are also much smaller on a small-scale map. Therefore a small-scale map shows many large things in a small space. A large-scale map can show many facts about a small area. Always notice the scale of miles on a map. Remember that each inch on the map means a certain number of miles on the earth. Then, by using a ruler to measure distance on the map, you can tell how far apart are any two places on the earth.

More about east-and-west lines. You remember that all places on an east-and-west line are in the same latitude. The east-and-west lines on maps and globes help us in telling what direction one place is from another. All places on an east-and-west line are directly east or west of one another. This is also true, of course, for the Tropic of Cancer, the Tropic of Capricorn, the Arctic Circle, and the Antarctic Circle.

North-and-south lines. Your globe also has lines running around it north and south through the poles. The globe on this page shows these lines. All places on such a line are exactly north or south of one another. By using the north-and-south lines you can tell, for example, that the Eskimos live almost directly north of the Forest Indians.

Using lines to tell directions. Now look on the globe on page 147. What do you see on this globe to help you tell your directions? Besides north, east, south, and west, you can find there the in-between directions: northeast, southeast, southwest, and northwest. Northeast lies halfway between north and east. How do the lines on this globe help you to find northeast? Each in-between direction lies halfway between the two directions in its name.

Find the United States on this globe. Now look for the Mississippi River. In what direction does it flow to reach the



Gulf of Mexico? Which is in the higher latitude, the river's source or its mouth?

Next find the Amazon River in South America. In what direction does it flow to reach the Atlantic Ocean? What part of this river is in the lowest latitude?

Now tell whether the people of Tierra del Fuego live directly south of the Forest Indians, or southeast or southwest of them.

Remember that *up* means away from the center of the earth, and *down* means toward the center of the earth. You can speak of going up or down a mountain. But when you mean toward the poles, you should say "north" or "south."

Work and Play in Geography

Here is a game. Some of the descriptions in this list tell about primitive peoples. Others tell about peoples who live in complex ways. Make two columns on your paper. Head one "People who live in primitive ways," and the other "People who live in complex ways." Copy under each heading the descriptions that tell the truth about that heading.

a. live in cities
b. are nomadic
c. grow feed for beef and dairy cattle
d. live in thinly settled lands
e. give little care to farm lands
f. satisfy their needs from the earth close by
g. live in lands which are poor for most occupations
h. are self-sufficient
i. carry on trade with other people
j. are shut off from other people
k. are becoming fewer and fewer
l. use simple tools
m. ride in airplanes
n. trade by means of barter
o. use many things produced by other people

DO YOU UNDERSTAND MAPS?

1. Write these in a column and beside them show (*by color or drawing*) how they appear on the maps in this book.

mountains (*color*)
hills (*color*)
plateaus (*color*)
plains (*color*)
a lake
a city
deserts (*two ways*)
forests (*two ways*)
a boundary between states or provinces
grasslands (*two ways*)
very dense population

2. Look through the first 147 pages of this book and write the page number of every map in which colors are used to show whether the land is high or low.

3. List the page numbers of maps in which colors are used to show mountains, plateaus, hilly lands, and plains.

4. List the page numbers of maps in which colors are used to show where countries or states or provinces are.

5. For what other purpose is color used on the maps in this book?

LOW, MIDDLE, OR HIGH?

Would you look in low, middle, or high latitudes for the following:

a. The equator
b. The north pole
c. The land of the Eskimos
d. A tropical climate
e. Very long, cold winters
f. Very long, hot summers
g. Cold winters and hot summers
h. The land of the Forest Indians
i. The school you go to
j. The land of the Reindeer People

A TEST ON MAPS

1. Are all places on the same east-and-west line in the same latitude?

2. On the map on page 147 how can you tell in which direction north is?

3. Which map of Africa would have the larger scale, one in which an inch stands for 100 miles or one in which two inches stand for 100 miles?

4. How are rivers shown on maps?

5. Where on a map do you look to see what a color stands for?

A WORD GAME

In the left-hand column is a list of words. In the right-hand column are groups of words that tell what the first words mean. Match the two columns.

activities	a group of families who live together
domesticate	all the things people own
herders	all the things people do
migrate	people who move about and have no fixed homes
nomads	to tame animals
possessions	to move from one place to another
primitive people	people who raise grazing animals
tribe	people who know how to do only a few things

WHICH DO THEY USE?

You have studied about these people:

Rice Farmers of China
Navajo Indians
Reindeer People
Nile Valley Farmers
Eskimos
Forest Indians
Canoe People

Which of the following things do each of the above people use? Example: *Canoe People* use *canoes for fishing*.

bamboo baskets for holding grain
spindles for spinning
kayaks for hunting seals
canoes for fishing
graters for breaking manioc
harpoons for fishing or hunting
shadoofs for raising water
nets for catching birds
sleds for traveling across snow
tanks for dipping sheep
hammers for beating silver

ANOTHER WORD GAME

Here is a list of words you know. Below are sentences with one word missing. Write the sentences, filling in the right words from the list. (*Do not write in this book.*)

complex
irrigate
pastures
population
starve
shelter
self-sufficient
subsistence
vegetation

a. A family that grows or makes almost everything it needs is ____.

b. All the people who live in a place are called its ____.

c. If you did not eat, you would ____.

d. Fields where cattle graze are called ____.

e. If you bring water to a field, you ____.

f. The plants that grow in a region are its ____.

g. The opposite of *simple* is ____.

h. Houses and other protection from the weather are ____.

i. A living from a man's own farm is called ____.

DOMESTICATED ANIMALS

In what part of the world might you live if you used these animals:

llama
camel
yak
goat
reindeer
water buffalo

DRAWING DIAGRAMS

Make nine different diagrams, showing each of these:

an isthmus
a gulf
a strait
a peninsula
a bay
a glacier
a prairie
a mountaintop
a canyon
how a river flows downward from its source to its mouth

JAMES SAWDERS — COMBINE

Because China has so many people, it has usually been cheaper to use laborers than to use animals or machines. Here laborers are smoothing a city street with a heavy roller.

The Country of China

You have already read about how people live in farming villages in one part of China. Let us now read more about China. It is a large country in Asia. It is on the opposite side of the northern hemisphere from the United States. When it is noon in the United States, it is night in China.

Your globe shows you that you could go to China in several ways. Sometimes people go westward by ship across the Pacific Ocean. They travel several thousand miles. Just before reaching China they pass through the South China Sea or the East China Sea. To go this way takes two weeks or more. The shortest way to China would be northward over the polar region in an airplane. But planes usually fly south of the Arctic Circle along a route where there are landing fields.

No one knows how many people live in China. We know how many live in the cities, but no one has ever counted the number of people in all parts of China. But we are certain that there are millions and millions of people. China is one of the most crowded countries in all the world and has the largest population.

THE FARMING VILLAGES

Most of the people of China earn their living by farming. The good farming lands are found on the plains of eastern China. For hundreds of years such land has been divided into very small plots. Thus many people can have a share of the best land.

A farmer does not build his home in his fields but in a village. The homes of all the farmers are close together in the village. The farmers want to save as much of their land for crops as they can. There are many narrow paths on top of the dikes. The farmers use these paths to reach their own fields.

Wherever crops can be raised, the land is cultivated. In hilly places many tiny terraces have been cut into the slopes. Sometimes a field is just a little corner of land. Every bit of good land is needed for crops to feed the many millions of people in China.

Village families. In a Chinese family there are many persons to feed — grandparents, children, and grandchildren. In most families there are ten to thirty persons. It is very unusual to find a family of only two or three persons.

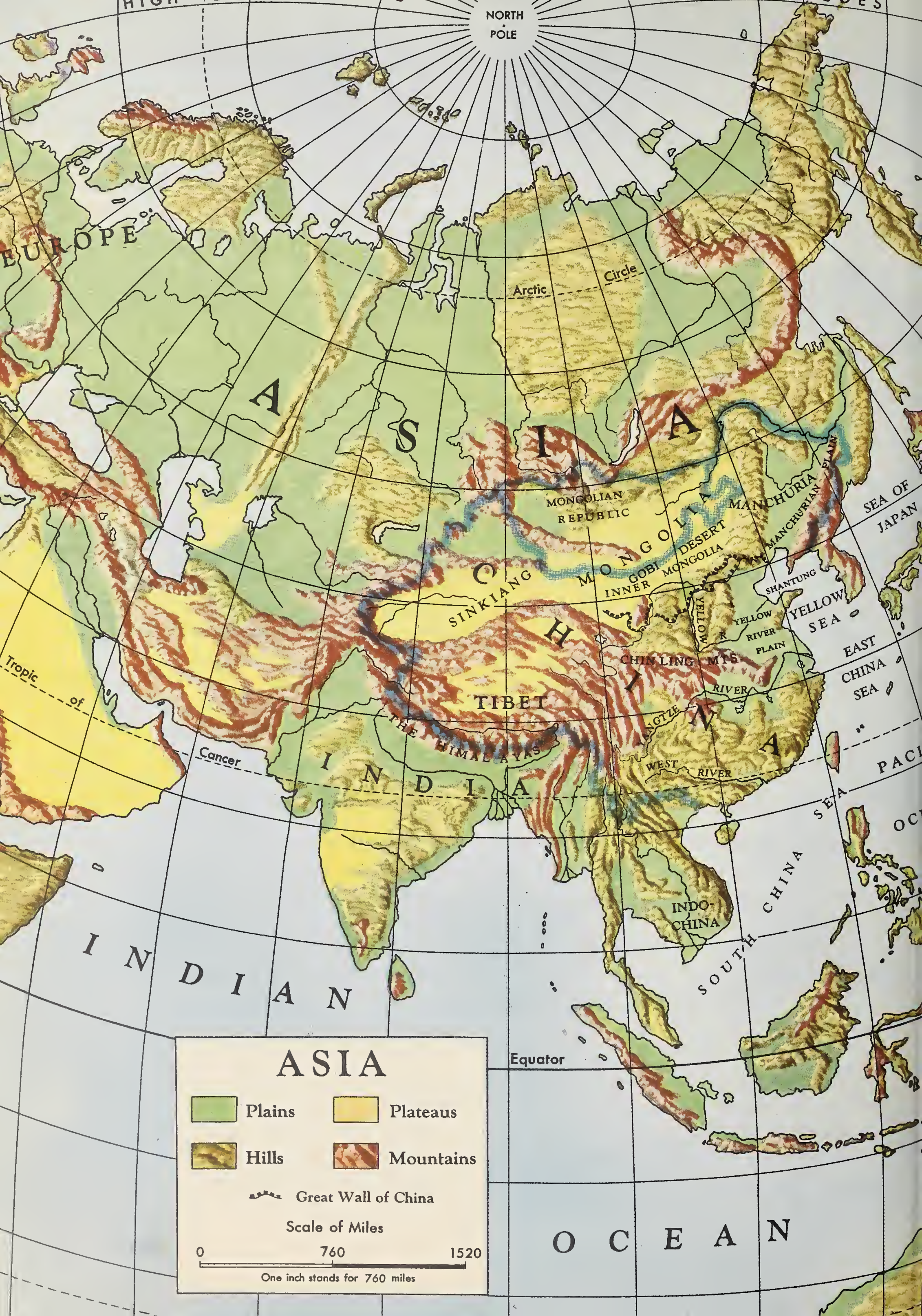
Many small farming villages in China are made up of members of a single family. Often the village has a wall around it, the backs of the houses forming part of the wall. Aged grandparents who are not able to work live in their little house or in part of a son's home. When a young man of the family marries, another house or part of a house is set aside for him. In this way the village may be made up entirely of people related to the oldest member.

While the grandfather is living, the village fields may be farmed by the whole group of relatives. When the grandfather dies, the land may be divided up among the families of his sons.

Many poor people. Over many hundreds of years the population of China has been growing larger and larger. Though China is a very crowded country, a large part of its land is too steep and hilly for farming. Much of the land is too dry. As the population increases, there is less land for each farmer. China's population is much too large for its good farming lands. The Chinese must try to make the fertile areas provide a living for more and more people. But they can hardly get enough food to go around. This is why so many of them are poor even though they are good farmers.

Of course, there are some wealthy Chinese. But most of the people do not live in comfortable homes. They do not go to high school and college. They seldom ride on a train or in an automobile or visit a foreign country. They have few things that come from other parts of the world. It is hard for them to make a living even when their crops are good.

Mud houses. Wood is expensive in most of China. For this reason the houses in most places are made of mud. In the villages people may make even their furniture, such as beds, tables, and benches, out of mud. Timber is used only for tools, for beams in building houses, and for a few other things. China has less wood for each person than any other important country in the world except India.


NORTH POLE
EUROPE
Arctic Circle
A S I A
MONGOLIAN REPUBLIC
MANCHURIA
MANCHURIAN PLAIN
SEA OF JAPAN
MONGOLIA
GOBI DESERT
INNER MONGOLIA
SINKIANG
C H I N A
SHANTUNG
YELLOW SEA
YELLOW R
YELLOW RIVER PLAIN
CHIN LING MTS.
EAST CHINA SEA
TIBET
YANGTZE RIVER
THE HIMALAYAS
WEST RIVER
I N D I A
Tropic of Cancer
PACI
SOUTH CHINA SEA
INDO-CHINA
OC
I N D I A N
O C E A N
Equator
ASIA
Plains
Plateaus
Hills
Mountains
Great Wall of China
Scale of Miles
0
760
1520
One inch stands for 760 miles

Seeing China with the Map

Here is a map of the continent of Asia, the largest of all the continents. Where is north on this map? Where is south? East? West? The country of China is named on the map. You can see that it reaches far west in Asia. It is larger than the United States.

Latitudes in Asia. Locate the equator on this map. Find the low latitudes, on either side of the equator. Find the high latitudes with the north pole in the center. Find the middle latitudes lying in between. See in what latitudes China lies.

China reaches farther south than any part of the United States. The southern part of the United States usually has mild weather even in winter. In South China freezing weather never lasts for more than a few days at a time except in the high mountains. But in northern China the winters are long and bitterly cold. Often the weather changes suddenly.

Four different kinds of land in Asia. Imagine that you are in a rocket ship hundreds of miles above Asia. You can see all of Asia at one time. The earth looks much like this map. But of course the earth is not colored like the colors on the map. Different colors are used on the map to show different kinds of land. Where you see red on the map, you see mountains in Asia. Where you see yellow on the map, you see plateaus in Asia. Which color stands for hills? Which color stands for plains?

Plains of North China. Do you see many or few plains in China? Are they in the eastern or western part of the country? There is not much level land in China. It is mostly hills and mountains.

In eastern China find the small peninsula of Shantung. We shall begin here to take a flying trip around China. To the west and north of Shantung the great Yellow River flows across a broad plain. This plain is crowded with farmers who make their living much as do the rice farmers in the lower Yangtze Valley.

Look northward to Manchuria. See the plain surrounded by hills and mountains. Men have their farms on this plain. Is there an opening in the mountains toward the north? Is there an opening between the Manchurian Plain and the Yellow River Plain? How do you think the people who live in Manchuria use these openings?

Mountains, plateaus, and deserts. Notice Mongolia and Sinkiang stretching away to the west. This area is a great rolling plateau crossed by a few mountain ranges. For many years Mongolia has been divided into two parts, Inner Mongolia and Outer Mongolia. But in 1946 Outer Mongolia broke away from China and became a separate country, with its own government. It called itself The Mongolian Republic. Inner Mongolia remained a part of China.

Where in Sinkiang do you see mountains? This great western part of China is a desert. It has no trees. There is scarcely any vegetation. Few people live there. The desert south of the mountains in Sinkiang is the driest region in all China.

In southern Sinkiang see the mountains that rise to the high plateau of Tibet. Much of Tibet is a frozen desert. Not even nomads can live in most of this wild land. Tibet is almost surrounded by high mountains. On its southern border are the highest mountains in the world, the

Himalayas. Some are covered with snow the year round. Eastern Tibet has deep gorges and high ranges. In a few valleys the land can be cultivated. But Tibet is mostly a cold, bare land.

River plains of South China. What do you see east of these ranges of Tibet? In South China almost all the land is rolling, and there are ranges of low mountains. Many small streams flow through these hills and mountains and join to form rivers. This map shows you the two largest rivers of South China. Each river has a flood plain. Which has the largest flood plain?

Outer China and China Proper. Now we are flying again over the eastern plains and Shantung. You have looked down on the high mountains, plateaus, deserts, and good farming lands of China. Now you know that most of the western part of China is waste land. It does not have enough rain for farming. People cannot make their living in a cold, dry desert. People do not live on the high snow-covered mountains either. This larger part of China, made up of Inner Mongolia, Sinkiang, and Tibet, is sometimes called Outer China. The rest of China is called China Proper. The Yangtze Valley is in China Proper.

The Yangtze River. Two of China's great rivers rise in cold Tibet. What rivers are these? Find the place where the Yangtze begins. Now we shall follow the Yangtze from its source in Tibet all the way to the sea. Do not make any marks in your book. We may want to take some other trips, and the marks would mix us up.

Notice that the Yangtze first flows southeast from Tibet. Does this part of the river flow through mountains, hills, plateaus, or plains? It winds about and then turns northeast. Notice where it comes out of the mountains onto a plain. From here to the sea the river flows on the Yangtze Plain. You can see that the plain is sometimes broad and sometimes narrow. Find the delta of the Yangtze. The delta is level land built up by soil that the river brings from the high western lands.

If you have followed the Yangtze without losing your way at any place, you are learning geography well, for the Yangtze is a very long river. Only four rivers in the world are longer.

The Yellow River. The other great river is the Yellow River. As you read about China, you will need to remember that this river lies north of the Yangtze.

EWING GALLOWAY AND
JAMES SAWDERS — COMBINE

Transportation by boat. On the left are small canal boats. On the right is a Chinese junk. Junks go out on the ocean, but do not go very far from land.

Find the source of the Yellow River. It rises in the mountains of Tibet where there is snow the year round. It bends again and again as it flows eastward. Follow the river over the plateau, through the mountains and hills, and out onto its plain. Where does the Yellow River flow into the sea?

FORESTS AND FLOODS

Few forests. Once China had fine forests. But the trees over large areas have been cut down as people needed more farming land. Today most people cannot get enough wood for their needs. In many parts of China wheat or rice straw is the only fuel the villagers have.

In the highlands of northwest China almost all the forests have been destroyed. In only a few areas are trees found on steep slopes. Southern China has larger forests than any other part of the country. Here, because of the warm weather and the heavy rainfall, trees grow fast.

Many floods. Because so many of China's forests have been destroyed, there is danger of floods in many sections of the country. Forests, you know, help to stop dangerous floods. Leaves that fall from the trees help to hold water in the ground and keep it from rushing down the steep land. The spreading roots of the trees also help. Where slopes are bare, water runs swiftly down into the valleys. It washes away the soil from the hillsides. The rivers swell and sometimes overflow their banks. Stones and sand are left on farm lands in the valleys. Great areas of land in China have suffered in these ways. Floods have drowned thousands of people and animals. The waters have destroyed crops and washed away the soil from fertile fields.

TRANSPORTATION

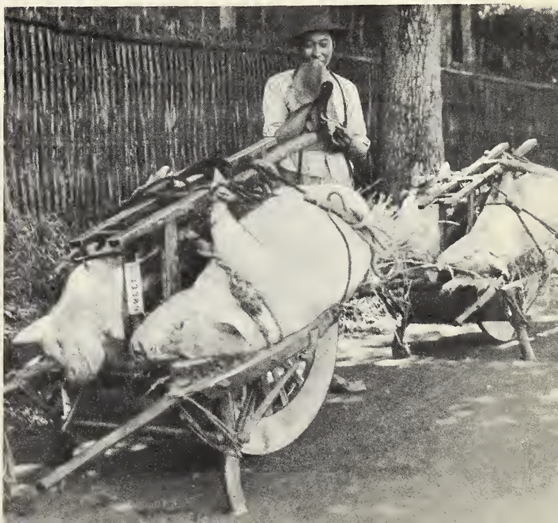
Traveling by boat. In parts of China Proper there are many rivers and canals. People travel up and down these waterways instead of traveling on roads. A farmer packs his produce into a flat-bottomed boat. Standing in the boat, he pushes with a long pole against the bed of the stream. Or he may push a long oar back and forth in the water behind the boat in such a way as to make the boat move in the direction in which he wants to go. Usually he travels only a short distance to reach the market. There he sells his vegetables or grain.

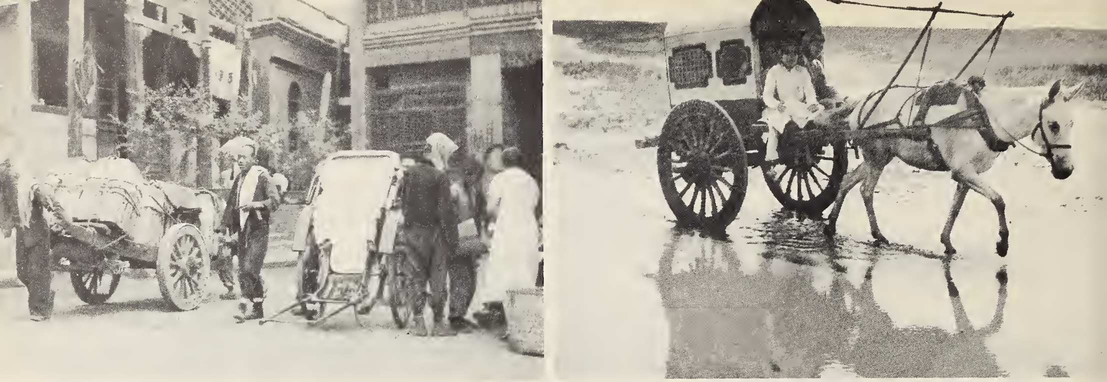
The Chinese carry goods in river or canal boats wherever they can. The boats they use, however, are different on different streams. On shallow streams the Chinese use boats with flat bottoms. Sometimes they ride in sailboats called *junks*. On swift streams they use boats that curve up at the bow and the stern.

Traveling by road. If there is no stream, the Chinese often walk over the rough roads carrying their burdens. Many of these roads are trails made of flat stones or just hard earth. If a man is rich, he pays a *coolie* to carry his burden.

Bringing live pigs to market by wheelbarrow.

EWING GALLOWAY





JAMES SAWDERS — COMBINE, AND EWING GALLOWAY

Primitive transportation. On the left a man is pulling a heavy load in a two-wheel cart. An empty ricksha waits for its passenger. On the right is a covered cart in Manchuria.

A coolie is a Chinese who makes his living by carrying freight or by doing other hard labor. He carries heavy loads, and travels perhaps fifteen or twenty miles a day. In a few parts of China pack animals as well as coolies are used in carrying loads. The farmer may keep a mule or a horse or perhaps a donkey. Most Chinese, however, are too poor to feed a work animal. They do their labor themselves.

Often passengers and freight are moved in wheelbarrows. Two people may ride at a time, sitting sideways with their feet hanging over. Or a man may ride and take with him a pig or some goods he has bought at market. A coolie pushes the wheelbarrow.

When a family moves, perhaps northward to Manchuria, the farmer must provide a way for some members of his family to ride. The very old and the very young cannot walk far. If the family lives in North China, the man uses a two-wheel cart pulled by an animal. The cart moves very slowly, of course, shaking the passengers about. It does not have springs and is not comfortable to ride in over the rough roads. If the road is dry, dust rises around the cart. In the rainy season the wheels sink in deep mud.

Visitors to a large Chinese city see passengers in *sedan chairs*. These chairs have a pole on each side and are carried by two coolies, one in front and one at the back. Silk or cotton cloth is stretched over the top and sides of the chair to keep out the sun and wind. Each chair will hold one or two persons. Wealthy Chinese often ride about in these chairs. Travel by sedan chair is one of the oldest ways of traveling in China.

Rickshas are light wheel-chairs, each pulled by a coolie. He trots along the street drawing the wheel-chair just as an animal might. A ricksha holds one or two passengers. You already know that a country in which men carry or pull burdens has primitive transportation.

The roads joining villages are not suitable for automobiles. They are narrow and poorly paved or not paved at all. Besides, most Chinese cannot afford to buy cars or the gasoline to run a car.

Of course, in the great Chinese cities like Shanghai you would see automobiles and motor buses on the streets. But along with these you would see many Chinese using the old ways of travel.

Traveling by railroad. No railroads go all the way across this huge country.

If you were in Shanghai at the mouth of the Yangtze and wanted to see the vast cold desert of Tibet, you could not go there by train. There are some railroads in eastern China, but western China has no railroads at all.

In what part of China Proper would you expect to find the most railroads? In the south there are so many rivers and canals that the Chinese do not need trains. About half of all the miles of railroads are found in Manchuria. Only a few lines enter South China.

Trains in China are always crowded with passengers. Freight trains are heavily loaded. Wherever railroad lines have been built, every bit of train space is used. The Chinese need more railroads than they have. So they are planning to build many more railroad lines through their country.

Visitors from other countries often find it hard to travel through China. The people in this old, old country are slow to give up their old ways for modern ways. Most means of travel are slow and make much use of human labor. Large numbers of people work at transporting passengers and goods. They work very hard for small pay.

THE LANDS AND REGIONS OF CHINA

Now you know that China Proper is very crowded. Busy farmers till every small patch of good land. Boats go up and down the streams. People even live in boats because there is no place for them on land. Most of the railroad lines are also in China Proper. You know, too, that Outer China has very few people and is mainly dry cold desert. Why is there this great difference between the climate of east and west China?

CNS PHOTO FROM GUILLUMETTE

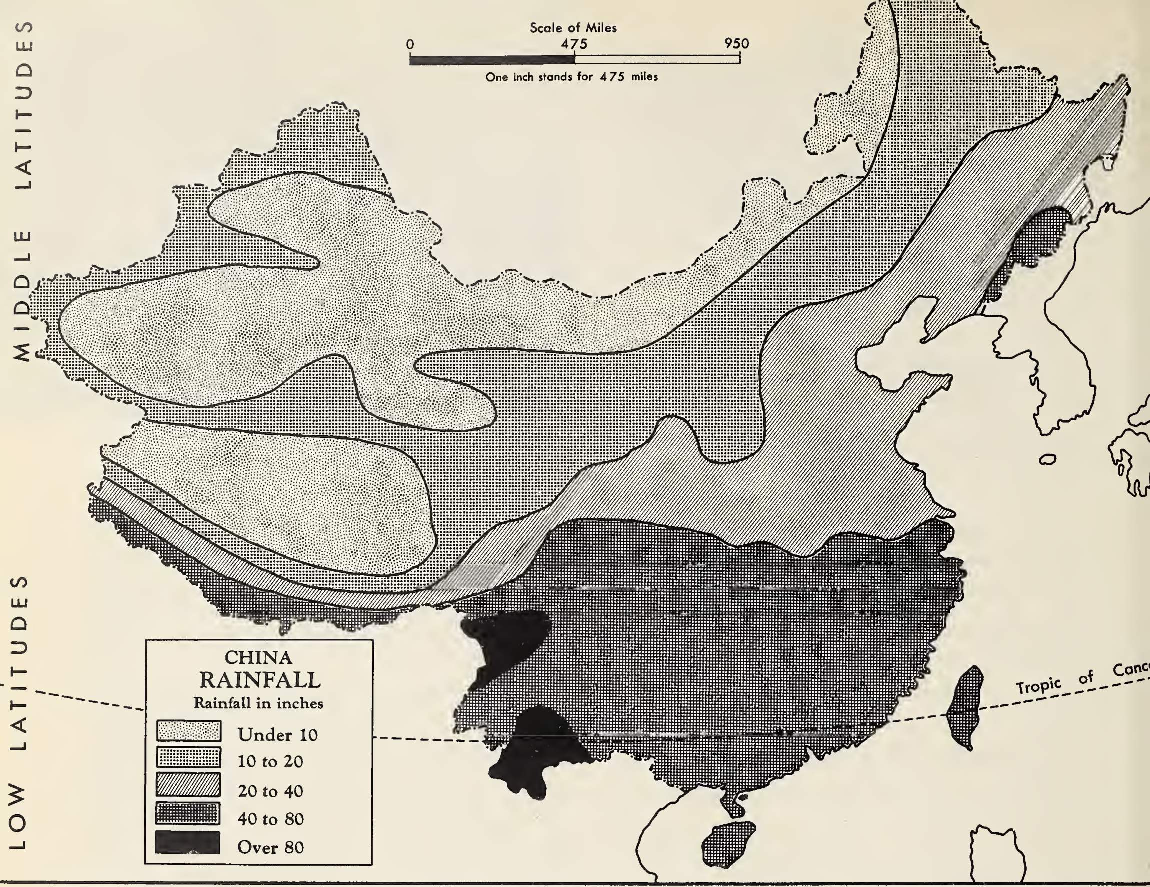
A busy railroad station in South China. The people are waiting to get on the train.

Rainy and dry lands. The Himalaya Mountains shut off western China from the southern part of the continent. Find these mountains again on the map on page 152.

In the summer wet winds come from the ocean to the southeast of China. These winds have taken up moisture from the ocean. As air rises, it becomes cooler and drops some of its moisture. So eastern China has rainy summers. But the ocean winds seldom pass over the high Himalayas. They do not bring moisture to the dry inner part of China.

In winter, cold, dry air moves from the northwest. It blows over the land toward the sea. Although the skies are clear and the sun shines, people shiver with the cold.

Winds such as these, which change with the seasons, are known as *monsoons*. You should remember that it is the summer winds that bring rain to the eastern part of China. If for some reason dry weather comes in summer, the crops fail. The people suffer from lack of food. During the cold winter when they can raise no crops, they may even starve. Again and again the people of North China have suffered hunger and other hardships.



This map is a rainfall map of China. It shows the amount of rain or snow that falls at any place in a year. Study the key of this map. Find an area that has more than eighty inches of rainfall. Find one that has very light rainfall, less than ten inches. From this map you can see that the southeast is a rainy land. Remember that the rains of China come at only one season of the year. The southeast is very rainy in summer. The north, however, is partly arid. Western China is a desert, the driest part of all China.

In the dry west pastures are few and poor. Farming is impossible except in oases. It is too dry and cold for many people to live there.

Regions of China. In this large country there are two great regions, North China and South China. Find these regions on the map on page 159. Which is larger, North China or South China?

Now turn to the map on page 152. Find North China and South China on this map. Find the lower Yellow River and the lower Yangtze River in China Proper. Next notice the Chin Ling Mountains that cross the central part of China. Think of an imaginary line starting from the coast halfway between the mouths of the two rivers and going west across the tops of the Chin Ling Mountains. It will pass along the northern edge of the plateau of Tibet. North of this line is North China. South of it is South China. This is the line that separates the dry north from the rainy part of China Proper. Most of the rain that is brought by the summer monsoons falls south of this line.

North China is the great wheat region. The wheat is grown in the eastern part, in China Proper. For much of the year the wheatlands are dry and brown. They are green only while the crop is growing. The north is a land of little rainfall.

South China is the great rice region. The rice areas too are in China Proper. This eastern part of South China is a land of much rainfall. It is green, not brown and dusty like the north. It is a region of canals and paddy fields.

Of course, the western parts of both North China and South China are thinly settled. Here are thousands of miles of deserts and mountains.

BARRIERS AROUND CHINA

In your study of geography you will often have to know about *natural barriers.* A *barrier* is something that stands in your way. It keeps you from moving easily from place to place. And if it was not put there by man it is known as a natural barrier. Suppose you were walking along and came to an immense, steep mountain or a deep, deep canyon. The mountain would be too steep to climb easily. The canyon would be too deep to cross easily. You would be facing a natural barrier.

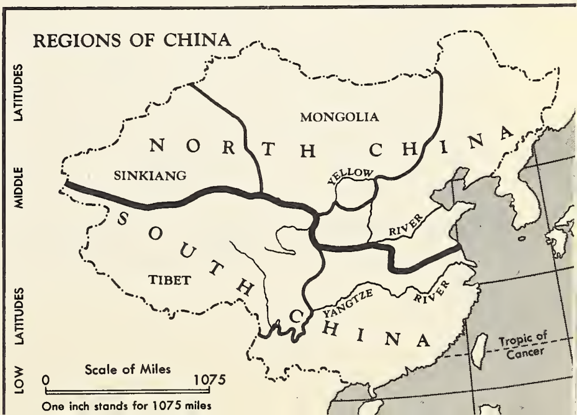
A country shut off from its neighbors. Perhaps you have noticed that China is bordered by seas, deserts, or high mountains. For thousands of years these natural barriers shut off the Chinese from their neighbors. The Chinese stayed in their own country, and only a few people came in from the outside.

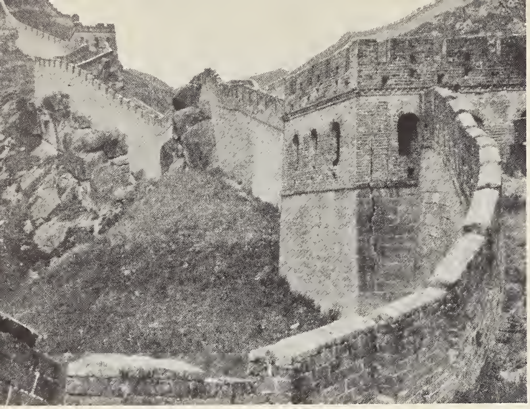
The ocean. Look again at the map on page 152. To the east is the great Pacific Ocean, the broadest of all oceans. Before the days of modern ships, the Chinese feared this ocean. They were not a seagoing people who loved to travel by ship. A few sailing vessels came to the cities on China's seacoast. And once in a while a few Chinese sailed eastward to the islands of Japan. But the ships did not have to sail far, as you can see on the map on page 152.

The Gobi Desert. The part of old China that could be crossed most easily lay in the north. The northern border passes through the wide Gobi Desert. In some years there was more rainfall than usual. Since the land was not then so dry, the edges of the Gobi Desert could be used for farming. Then the Chinese moved northward to plant crops on the grasslands.

They found few people living in the north. On the edges of the desert lived nomads who raised goats and sheep. These shepherds wandered over great stretches of land trying to find pasture for their herds. In very dry years there was no grass. Then the nomads went southward into China and seized parts of the grassy land there.

The Great Wall of China. The Chinese, of course, did not want nomads roaming over China. Therefore they planned ways of keeping these shepherds





EWING GALLOWAY

The Great Wall of China. From the roadway along the top of the wall the Chinese could defend it against nomads trying to cross it.

out. Thousands of years ago they built a high wall along their northern border. Patiently they built sections of the wall at different times over many years. More than two thousand years ago a Chinese emperor joined together the sections to make the Great Wall of China.

This wall reached westward all the way from the Yellow Sea to the edge of Tibet. As time went on it was built over or made longer several times. The Great Wall separates the dry lands of the north from the farming lands of China.

Yet the wall did not keep the nomads out or the Chinese within their own lands. During dry years the shepherds continued to seek the wet lands south of the wall. When there was plenty of rainfall, the Chinese went north of the wall. They hoped to find lands that could be farmed and to plant crops there.

Parts of the Great Wall are still standing today. Other parts have fallen down, and the people living near by have used the bricks and stones in different ways.

Tibet and the Himalayas. On the west also the Chinese were shut off from their neighbors. Travel westward over the high plateau of Tibet was almost impossible. On the map on page 152 see the peaks surrounding Tibet. In olden times a few visitors came to China from countries to the west. But they had to follow a roundabout route through Sinkiang and the high valleys of the western Himalayas.

On the southwest, China touches the country of India. This border is crossed by mighty ice-covered mountains. Deep gorges make travel the most difficult in all the world.

The forests of Indo-China. The southeast border of China touches the peninsula named Indo-China. For many years the Chinese feared to cross this border because of the dense tropical rain forest. There was danger of getting a disease called *malaria*. In those days nearly everyone who got this disease was sure to die.

Life inside the barriers. So the Chinese were separated on all sides from other peoples. They had to live on what was produced in their own lands. They carried on a little trade with other peoples, but they did not visit foreign lands. They sold gems or silks or other goods to merchants who came from near-by lands. The merchants sold these goods to traders who came from farther west. Finally the goods reached countries thousands of miles to the west, in Europe.

Even in olden times the Chinese knew how to read and write. They kept records of happenings in their land. Yet they knew little about the way people were living in other places. They thought of their land as the center of the whole world.

In this book you will read next about North China and then later about South China. After that you will read about the great cities of China where thousands of people live, crowded close together.

What Do You Know About China?

Some of the following statements are true, and some are not. On a sheet of paper write *True* and then list under it the numbers of the statements which are true. Do not turn the pages of this book.

1. China is on the opposite side of the world from the United States.

2. China is on the opposite side of the northern hemisphere from us.

3. The rainy season in China is the summer.

4. During the rainy season the winds blow from the land to the sea.

5. The people of China are scattered evenly over the country.

6. Most of the people live where there are good farming lands, and other parts of China are thinly settled.

7. The Chinese people live mostly in cities.

8. Many Chinese farmers are rich.

9. The villagers of China have barely enough food to live on.

10. Most of the people of China earn their living by fishing.

11. China is chiefly a farming country.

12. The most important occupations in China are manufacturing and herding animals.

13. China is made up largely of plains.

14. Large areas in China are hilly or crossed by mountains.

15. The Yangtze River is the longest river in China.

16. The Yellow River is longer than the Yangtze River.

17. China is a very old country.

18. China is not so old as the United States.

WORKING WITH MAPS

1. On an outline map of Asia draw little arrows to show the path taken by the winter monsoons. Mark this map *Winter Winds*. On another map show the direction of the summer monsoons. What should you mark this map?

2. Make sure that you can find each of these places on a map or globe: Mongolia; Sinkiang; Tibet; Indo-China; Gobi Desert; India; South China Sea; East China Sea; Manchuria; China Proper; Outer China.

3. On the map on page 152 find the Great Wall. Are there more streams to the north of this wall or to the south of it? What difference does this make?

4. On a map of the world show that the Gobi Desert is really a part of the great desert that begins in northwestern Africa. What is this desert called in Africa? On a globe show that this great desert reaches nearly halfway around the world.

5. Find China on the rainfall map on page 80. See how many inches of rain the western part has each year.

WORDS TO EXPLAIN

wheelbarrow
sedan chair
malaria
coolie
ricksha
monsoon
gorge
junk

EWING GALLOWAY

When the Yellow River floods its banks, the Chinese must build up the dikes. These Chinese are weaving mats of straw and sticks. The mats will be used to plug holes in the dikes.

North China

CHINA'S SORROW

You remember that the Yellow River rises in cold Tibet. It flows so swiftly through the western highlands that it cuts a deep gorge. It carries away a great load of yellow soil. Also it picks up loose bits of rock and pebbles. Its *channel*, or bed, gets deeper and deeper. Then, after coming out of its gorge, it wanders over the Yellow River Plain. The water is so full of mud that its color is yellow. Here its channel slopes very little. The water flows more slowly. As water slows down, it cannot carry all the mud it picked up when it was running fast. For this reason the river keeps dropping some of the yellow mud as it flows over the gently sloping plain. Do you now see how this great river got its name?

The Yellow River drops in its own channel much of the mud that it is carrying. The channel may become so filled with mud that it cannot carry all the water. Then the river overflows its banks and floods the surrounding country.

Dikes along the Yellow River. To keep the Yellow River within its banks, the Chinese long ago built dikes along the banks of the river. As the channel filled with mud, the dikes were built higher and higher. Now the river flows on a ridge above the plain. The land on either side slopes downward from the river.

Sometimes, after heavy rains, the river has broken the dikes and overflowed its banks. As it flowed down the slope of its plain, it cut a new channel. At least eleven times it has changed its course in this way.

The farmers using the fields that border on the river never know when it may change its direction. They are always afraid that it may make a new channel through their fields. So the people take good care of the dikes to keep the river from breaking through. The men keep watching the dikes and carry mud to any part that seems weak. They pack the mud down to keep it from washing away easily. In the past the river has sometimes flooded vast areas, drowning millions of people. Many who escaped the flood lost all they had. Some starved to death. For this reason the Yellow River is called "China's Sorrow."

Famines. When the Yellow River rises and overflows its banks, the farmers can only sit by and watch their crops disappear. If they are to have crops that season, they must plant new ones. But often there is not time for new crops to grow before cold weather comes.

During some years, there is little or no rainfall on the Yellow River Plain. The summer weather is too dry for crops to grow. Weeks pass without rain. The seeds that have been sowed dry up in the ground. Young plants wither for want of moisture. The fields are dry and brown as in winter. The farmers know then that they will have no crops that year. A time like this is called a *drouth.*

When harvests in North China are small, the farmers and their families do not have enough to eat. But when their crops fail from too much or too little rain, they may have nothing to eat at all. They are hungry but can get no food to satisfy their hunger. This is *famine.*

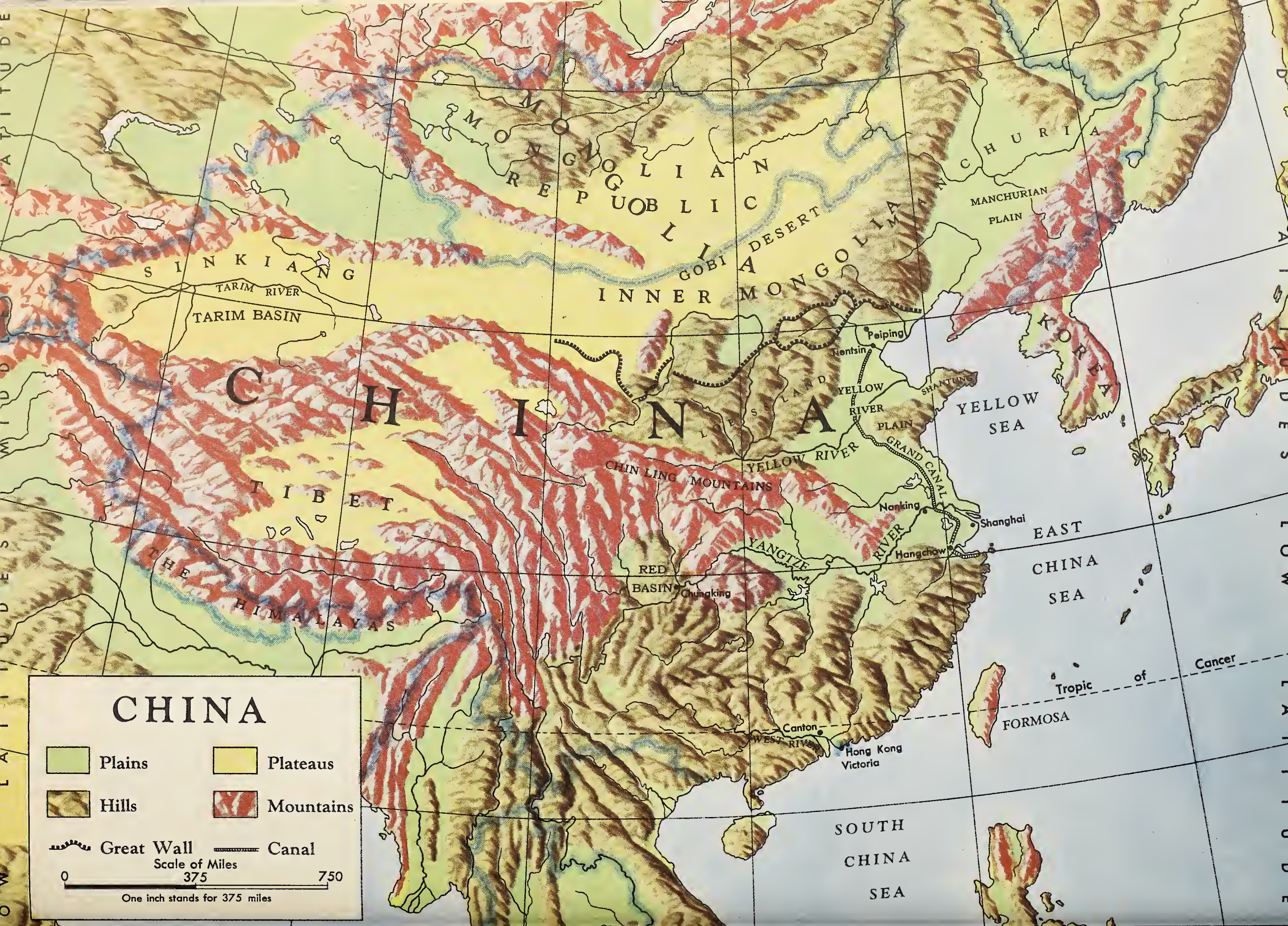
During a famine a person gets thinner and thinner. He soon becomes so weak that it takes all his strength just to walk a little way. After a while he cannot even walk. Because he is so weak, he catches diseases easily. Slowly the person gets weaker and sicker until he dies.

Famines in North China have destroyed millions of people. Even today famines occur in China. Transportation is so poor that food cannot be rushed from one part of the country to another part that needs it. Even when there is no real famine, there may be a lack of food in an area. People get some food, enough to keep them alive. But they do not have the food they need to be strong and healthy.

Saving flood waters. The famines on the Yellow River Plain come from much the same cause as did the famines in old Egypt. Although the floods from the Nile irrigated the fields, in some years the floods would be too high. Then they would destroy villages and drown many people. In other years there would be drouth near the sources of the Nile. The Nile would be too low to flood the fields and the crops would wither in the dry ground.

Today, however, the Nile farmers do not have to fear either drouth or flood. Because of the Aswan Dam there are no longer such dangers. The water from heavy rains is stored behind the dam and, as you know, can be used for irrigation at any time of the year.

Perhaps some day the high waters of the Yellow River will also be held back and saved for irrigation purposes. Then the Chinese farmers will be much better off, for they can expect good crops every year. There will be no more famine on the Yellow River Plain.


CHINA
Plains
Plateaus
Hills
Mountains
Great Wall
Canal
Scale of Miles
0
375
750
One inch stands for 375 miles
MONGOLIAN REPUBLIC
MONGOLIA
MANCHURIA
MANCHURIAN PLAIN
GOBI DESERT
INNER MONGOLIA
SINKIANG
TARIM RIVER
TARIM BASIN
CHINA
TIBET
THE HIMALAYAS
CHIN LING MOUNTAINS
LOESS LAND
YELLOW RIVER
YELLOW RIVER PLAIN
GRAND CANAL
SHANTUNG
RED BASIN
Chungking
YANGTZE RIVER
Peiping
Tientsin
Nanking
Shanghai
Hangchow
Canton
WEST RIVER
Hong Kong
Victoria
KOREA
JAPAN
YELLOW SEA
EAST CHINA SEA
SOUTH CHINA SEA
FORMOSA
Tropic of Cancer
MIDDLE LATITUDES
LOW LATITUDES

Around North China by Map

Look again at the great continent of Asia on the map on page 152. Maybe you can see exactly where this map of China fits into the map of Asia. This map of China is really a larger drawing of that small part called China on the map of Asia.

You should be able to locate North China on this map. Notice that there are two large plains in the east. One is the Yellow River Plain, the other, the Manchurian Plain. Which plain is the larger? Which is farther south? Which lies within the Great Wall?

Now look at the rest of North China. Do you see any mountains? Where are they? What other barriers to travel do you see? Where in North China do you think farmers live? Most of the people living in North China are farmers, but they grow wheat instead of rice.

A plain built by a river. Find the peninsula of Shantung. Many thousands of years ago Shantung was an island in the Yellow Sea. There was ocean water where we now see the Yellow River Plain. This plain is a delta built by the Yellow River. The delta grew slowly from a shallow bay into dry land. Every rainy season the Yellow River brought down *silt* and dropped it near the mouth of the river. Silt is the fine earth, carried by the water. As years went by, the silt filled up this part of the Yellow Sea. Even today the river is building more and more land which the Chinese can farm.

The climate of the Yellow River Plain. Now let us look again at the Yellow River Plain. This plain has high summer temperatures. The sun blazes down strongly. Its warmth is almost too great to bear. If there is enough rain, the farmers have large harvests. But if the weather is dry, the plain is almost a desert. Crops fail, and the people starve.

In winter the winds come from the northwest and are bitterly cold. They bring no moisture. Instead they dry up the land, and it becomes brown and parched.

Cities of the Yellow River Plain. How many cities and towns do you see on the Yellow River Plain? What are their names? There are many towns on the plain that are too small to be shown on this map. Some are market towns. Others are places where railways meet or where small factories have been built. Peiping is a very large city, just southeast of the Great Wall. Notice that Tientsin is located on a river near the sea.

The Manchurian Plain. In what direction must you go from the Yellow River Plain to reach Manchuria? The fertile Manchurian Plain is almost surrounded by mountains. It is not level like the Yellow River Plain, but instead is gently rolling land. It has several rivers and smaller streams.

Manchuria lies halfway between the equator and the north pole. It is neither in the low latitudes nor in the high latitudes. In what latitudes does it lie? In the middle latitudes there are great differences in the seasons. Winter is very cold. Summer is very warm. You will find out that this is true in Manchuria.

Land built up by the wind. Find the name Loessland on this map. It is called Loessland because the region is covered with a fine yellow dust known as *loess.*

The wind picks up this dust and carries it along in great clouds. On steep slopes there is no loess. It has all been blown away. In level places the loess may be three hundred feet deep.

A vast, barren desert. Look westward now at Mongolia and Sinkiang. Water is scarce in these regions. The few rivers and springs soon dry up after a rain. The land is covered thinly with sand or pebbles. In a few places there are sand dunes like those of the Sahara. Find the Gobi Desert. There are several deserts in the west, but the Gobi is the largest. On the edges of these dry lands some rain falls. There is usually enough moisture for a little grass to grow. This grassy border is known as the *steppe*. Men can get their living only on the steppe and in the oases.

Notice the name Tarim Basin in Sinkiang. This basin is almost surrounded by fertile oases. Our trip by map through North China will end in the Tarim Basin.

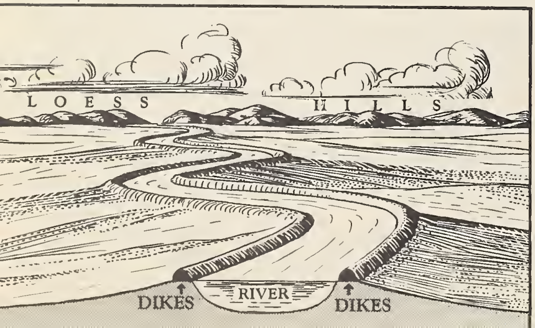
Seeing the same region on different maps. Perhaps you have already noticed that each region appears large on this map. It is much larger than the same region on the map of Asia, page 152. Look at the Yellow River Plain, first on this map of China, then on the map of Asia. Find Mongolia, Sinkiang, and the Manchurian Plain on both maps. Then you will see that each region is larger on this map. The mountains, hills, plains, and plateaus are all larger. You should be able to explain why.

Look at the scale of this map. How many inches on this map stand for 750 miles on the earth? About how many inches are needed on the map of Asia to show 750 miles? Which map has the larger scale? Both maps show all of China. But this map shows China more clearly. The map of Asia, however, shows a much larger part of the world.

The course of the Yellow River. Which of the two great rivers of China is in the north? Find its source in the mountains of Tibet. At first, the Yellow River is a narrow, rushing stream. What can you learn from the map about the kind of land it flows through in Tibet? Over what does it pass as it swings northward to Mongolia? Notice that it makes another great bend as it flows east to the Yellow River Plain. Where does it join the sea? At times the mouth of the Yellow River has been south of the peninsula of Shantung. Once the Yellow River almost joined the Yangtze.

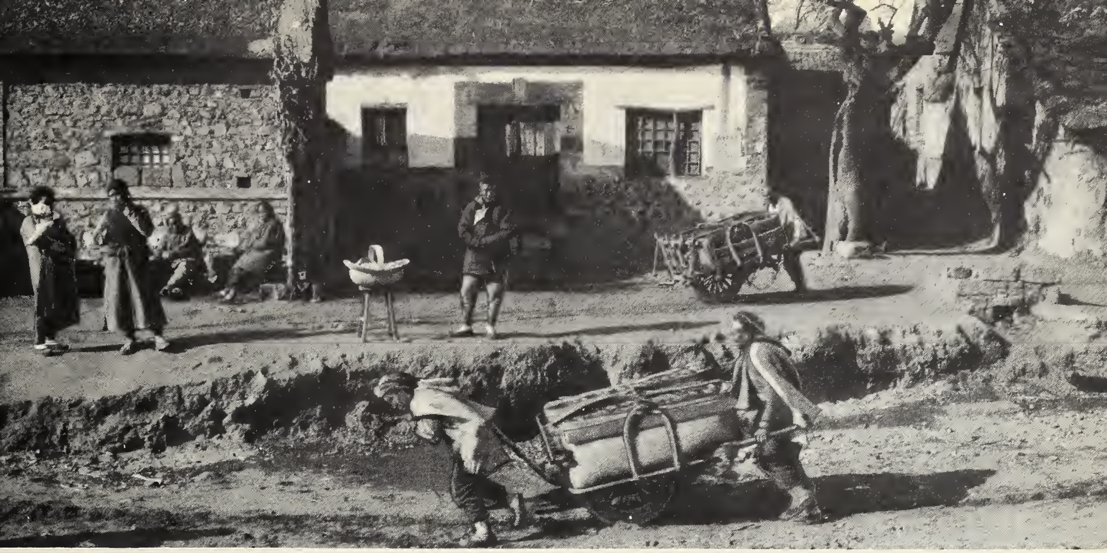
The Yellow River has many rapids and waterfalls. At several points boats cannot travel on its waters. At other points men use small boats only. They cannot use steamships at all. When a deep river flows across gently sloping land without waterfalls, boats can travel on it easily. Such a river is said to be *navigable*. In many places the Yellow River is not navigable.

In this drawing, the ground below the Yellow River has been cut away to show how the plain slopes away from the river.



THE YELLOW RIVER PLAIN

Notice the Yellow River Plain on the map on page 164. It is low except where the river pours out from the mountains. Here so much rich soil is laid down that



AMERICAN MUSEUM OF NATURAL HISTORY

In Shantung many houses have stone walls. Notice the mud roofs and the windows of slats and paper. The men with wheel-barrows are transporting coal from the mines.

the surface of the land has been raised. On this plain are fertile fields where peasants have their farms.

A simple village home. If you were to travel across the Yellow River Plain, you would see many farming villages. About nine tenths of the people of this region depend upon farming for their living. In one of these villages four children live with their father and mother, their grandfather and grandmother, and several other relatives. This is one of the smaller families. Some neighbors have a dozen children and many relatives living with them. It is the middle of June, and the summer rains have just begun.

This family, like many others in the village, lives in a house that is made of sun-dried cakes of mud. The roof rests upon wooden rafters held up by heavy crooked beams. These beams are the trunks of trees just as they were cut down. The carpenter who helped the man of the family build the house went with him to hunt small trees along the river. After the men had cut down the trees, they cut off the branches and brought the trunks home. Straw was laid over the rafters and covered with a thick layer of mud.

The house was built to face south so that in winter the family could have the warmth of the sun. To keep out the cold there are double doors. But they may be removed during the hot summer. The windowpanes are white paper. The paper is pasted over thin slats that criss-cross the window openings. Inside the house there is little furniture other than a stove and low brick bed covered with a straw mattress.

Today as the rain pours down, water trickles through the roof of the house in several little streams. The roof of dried mud has cracked because the weather has been hot and dry. When the rain stops, the children bring wet mud, and their father fills up the cracks in the roof. He smooths it over and leaves it to dry.

Now the roof will remain water-tight the rest of the season.

The house stands in a yard. Around the yard is a mud wall having one gateway. Just inside the wall are sheds for the farm animals and tools. These sheds are built without windows.

Farming on the plain. This farmer, like his neighbors, raises a dozen or more different crops during the year. If one crop fails, the other crops may provide food for his family. During the summer he raises corn, millet, and soybeans. Between the rows of corn he plants sweet potatoes or peanuts. Small patches are planted with beans, peas, carrots, and Irish potatoes. By October he is sowing winter wheat, and in the spring, *kaoliang*. Kaoliang is a very tall grass raised for its grain. On the Yellow River Plain barley and beans are also winter crops. Cotton and hemp may be grown in the spring.

The village men in their blue jackets patiently till the green fields. As the farmer works, he moves among high mounds of earth scattered here and there in the fields. These mounds have been heaped up above the family's graves like tombstones. Almost every little field has several graves. Here and there among the fields is a yellow strip of sand which was once the bed of a stream.

One of the farmer's young sons is busy cutting grass for the farm animals to eat. He likes his work except when the field is hot under the blazing sun. The younger children, too, have their work to do. They are wakened early in the morning. It is their task to gather leaves and dry grass for fuel.

Like the rice farmers, the farmers of the Yellow River Plain have only simple tools. They make many of their tools themselves. But they buy some from the carpenters or blacksmiths in the village. Their plows are made of wood except for a small iron tip, which digs a shallow furrow in the soil. Mules, donkeys, and oxen are sometimes used in plowing the larger fields. The vegetable gardens are usually spaded by hand, and they have to be irrigated.

A simple life. When harvest time comes, everybody is busy. The man and his family eat three good meals a day so that they can do all the hard farm work. But day after day they have the same food — boiled millet or kaoliang with a few vegetables, and steamed bread or noodles made of wheat. Most of their food is raised on the farm. They seldom have meat or rice. Meat costs too much. Little rice can be grown because there is not enough rainfall on the Yellow River Plain. The farmer buys only tea, salt, and cooking oil. When harvest time is over, the farmer and his family will have only two meals a day.

During the winter months, there is little work to be done in the fields. The people eat barely enough food to keep them alive. Only wealthy families have three good meals a day the year round.

In spring the monsoon comes from the southeast, bringing warm moist air from the sea. The June rains begin. Vegetation springs up. The brown land becomes green. The fields, deserted during the winter, are now filled with busy workers. The farmers try to make the soil produce plenty of food. But so many people live on this broad plain that there is little extra food from year to year.

In years when there is a good harvest, the farmer may take his whole family to a near-by market town to spend the day with relatives. The town has a few hundred houses, a dozen shops, and a temple

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Threshing wheat on the Yellow River Plain. The farmers beat the wheat to break the husks, and then throw it into the air, as the Nile farmers do. The mud houses are in need of repair.

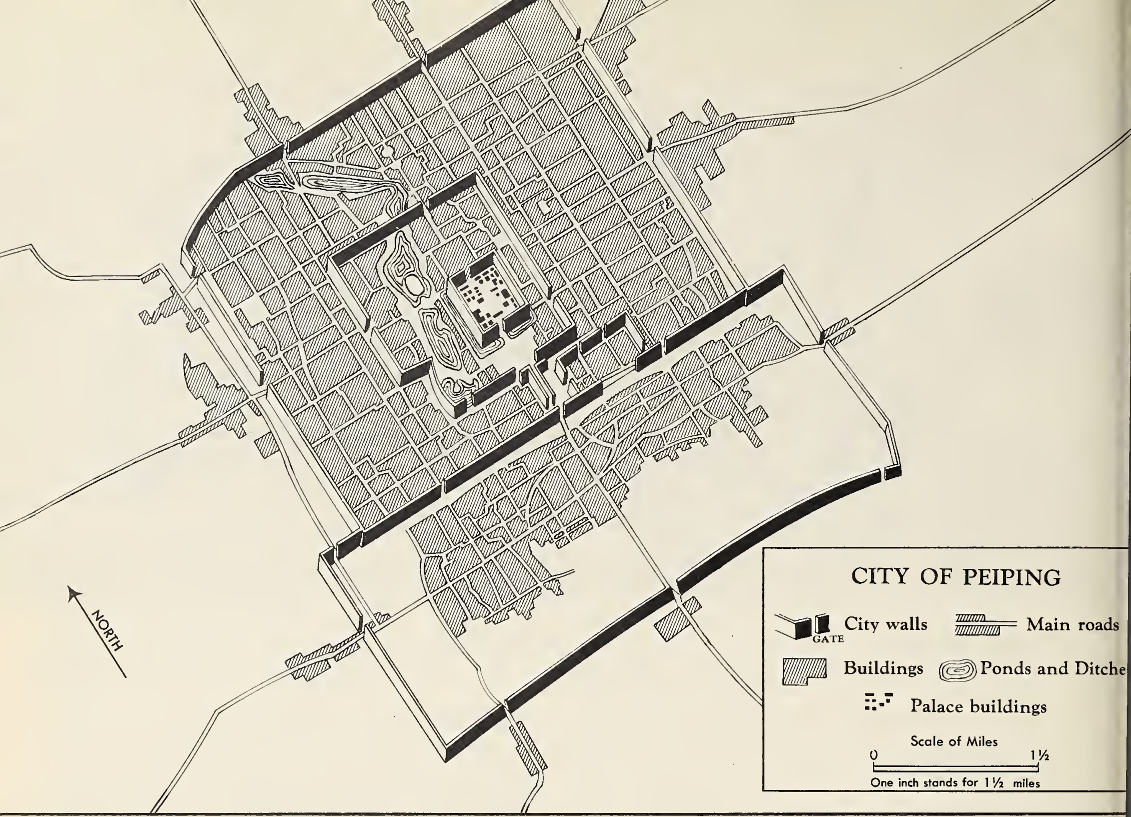
or two. Many village families never travel any farther than to the nearest town. They have few possessions, but their wants are few. They are satisfied with the necessities of life — food, clothing, and shelter. But sometimes the farmers cannot get even these necessities.

Peiping. Now you will visit a very large and fine Chinese city. It is Peiping. This city has a population of more than a million and a half. Only one city in China, Shanghai, is larger than Peiping. Find Peiping on the map on page 164. It is near the northern edge of the Yellow River Plain, southeast of the Great Wall. For a thousand years this city, long known as Peking, was the capital of China.

Whenever you read about a city in a geography book, you should ask yourself why the city was built in this location. Why did people come to live in this area? Cities do not grow up just by accident. There are usually several reasons for the growth of a city.

Perhaps the place is near a river where the water is deep enough for large boats. Farmers may send their products in wagons or railroad cars to be loaded on the boats. Many men work to move the freight from one means of transportation to another. The workers must have homes and stores in which to buy food and clothing. Soon a small town grows up at this place, where the water and the land routes meet. The place where routes of travel meet is usually a good place for a town. If men keep coming here to trade, the small town will grow into a big city. There are other reasons for the growth of a city which you will learn as you read more about cities.

Look on the map on page 164 and notice the location of Peiping near a break in the high hills. Such a break is called a *pass*, and therefore Peiping is a pass city. The pass near Peiping is the main gateway through the high hills to Mongolia. People from the desert pass



through Peiping to reach China Proper. Of course, people pass through Peiping going in the opposite direction too. Peiping is important also because it was once the capital, where laws were made. It has a long and interesting history. There are many buildings in Peiping that remind visitors of olden days.

Around Peiping is a high, thick wall having sixteen gates. Along the top of the wall is a road where people can walk. If you were walking on the wall, you would think the city a place of gardens. People often travel a long distance from foreign lands to visit Peiping. They want to see the beautiful temples and palaces and the collections of beautiful things made by the Chinese.

Cities within a city. Within Peiping there are really five cities. You can see each of these cities on the map on this page. In the center is the Forbidden City, the old home of the emperor. A wall of bright yellow tiles and a wide, deep ditch surround it. Long ago the ditch was dug to protect the Forbidden City from enemies. It was kept filled with water. Around the Forbidden City lies the Imperial City. It was once the home of the less important members of the court. Outside this area is the Tartar City. It is surrounded by a very high, thick wall. To the south of the Tartar City is the Chinese City, which has a wall also. In another part of Peiping is a section where people from other countries used to have their homes. Many of these people were sent by their governments to take care of official business with the Chinese government.

Tientsin. Look again at the map on

page 164 and find another large city on the Yellow River Plain. What is its name? Which city is closer to the sea, Peiping or Tientsin? Notice that Tientsin is located on a winding river, a short distance upstream from the river's mouth. This city has grown until its population is over a million. Perhaps you can see why.

Tientsin is a place where goods are shipped out to other cities. Wool, hides, and rugs from Mongolia are brought to Tientsin. They are loaded into small ships and sent to different markets.

The Yellow River Plain does not have a good seaport from which to ship its goods. Large ocean-going ships cannot reach Tientsin or any other city on the plain. Most of the seacoast of North China is bordered by shallow water. Sand fills river mouths almost to the level of the water. But at Tientsin the channel of the river is *dredged.* That means that the sand and mud are dug up from the river bed until the water is deep enough for ships to enter. Then small ships can reach the city. In winter the river freezes over, and the ice has to be broken up. Tientsin has grown to be a large city because no other city in the area is better for shipping.

Travel across the plain. Suppose that a farmer living on the plain wants to go to a market town, or a rich merchant plans to take a trip to Peiping or Tientsin. How does he travel? He might go by railroad. The Yellow River Plain has more miles of railway than any other region south of the Great Wall, and several railroad lines meet at Peiping. The farmer or merchant might even send goods to market by railroad. The railroads in this region carry enormous amounts of goods.

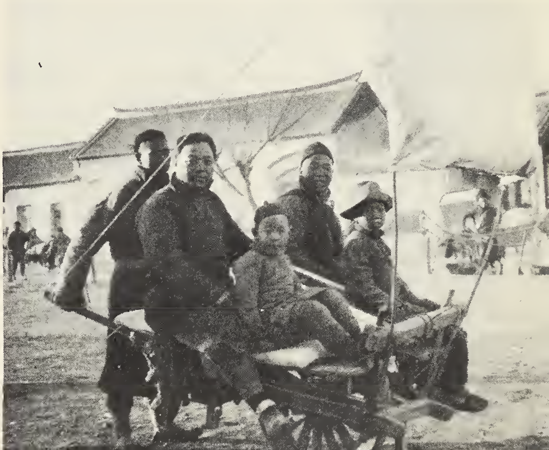
If the farmer travels on the roads, he

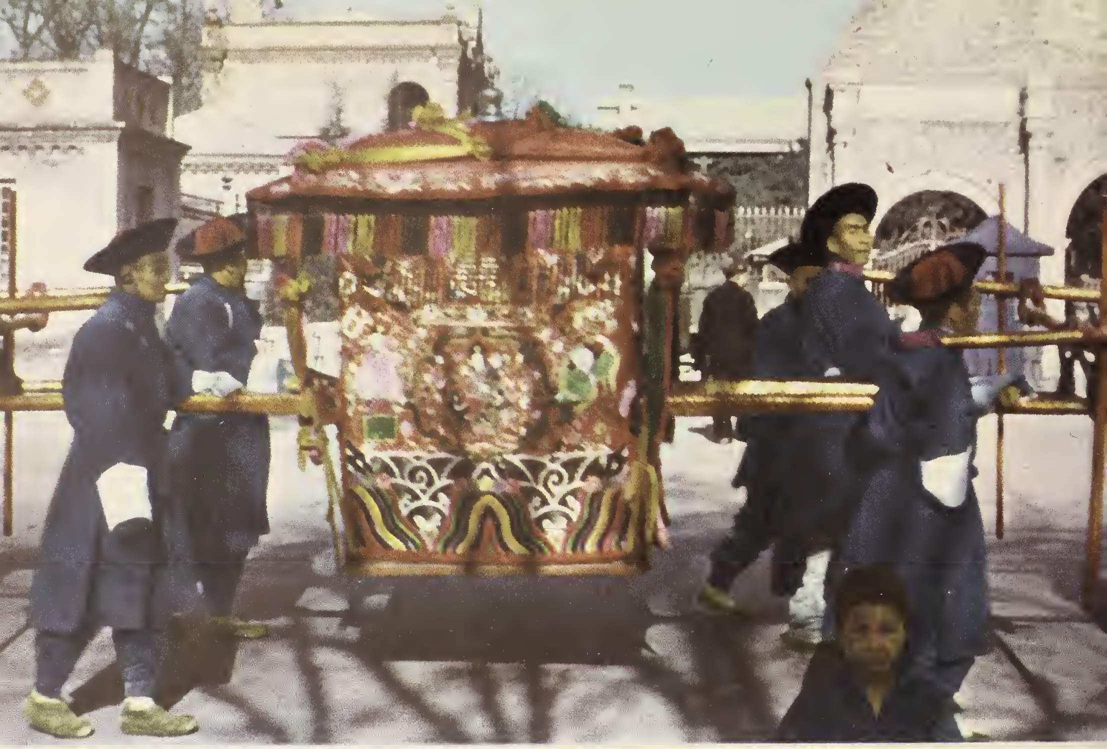
EWING GALLOWAY

Two views of Peiping. The upper picture was taken inside the Forbidden City. The lower one shows one of the main streets of the city.

Traveling by wheelbarrow on the Yellow River Plain. One man must push, but the sail helps.

EWING GALLOWAY





EDWARD C. HUDOWALSKI

This beautiful sedan chair is used to carry a wealthy Chinese bride to her wedding. She is entirely hidden by the embroidered silk hangings. Men from her family carry the chair.

will not have a comfortable trip. In summer, mud is usually deep on the roads. Sometimes they cannot be used for days at a time. If it is dry winter or spring weather, the ride will be a dusty one. Great clouds of dust rise from the loose soil as a cart or animal goes along the highway. This loose soil blows away easily. So much soil has already blown away that many roads are like narrow ditches below the neighboring fields.

Perhaps the farmer will ride in a small cart pulled by an animal. If he has goods to transport, they may be loaded into a large two-wheel cart pulled by from two to seven mules or donkeys. He will travel about twenty-five miles a day. This is very, very slow. An automobile, you know, moves on a good open road forty miles or more in an hour. The cart holds very much less than a large truck does.

Pack animals and wheelbarrows are also used to transport goods. Small boys often help their fathers by pulling on a rope tied to a squeaking wheelbarrow. Sails are sometimes fitted to the wheelbarrows to make use of good winds in moving them. You can see that the Chinese use both modern and primitive methods of transportation.

Shantung. Some products of the Yellow River Plain are sent eastward by railroad across the peninsula of Shantung to the sea. There they are loaded into ships to be taken to market. The map on page 164 shows you where Shantung is. What do you see on the peninsula — plains, plateaus, hills, or mountains? You have read that Shantung was once an island in the Yellow Sea. Around this island the Yellow River has built up its delta.

Farmers and their families have their homes in the valleys or on the level lands where the valleys open onto the Yellow River Plain. These people live in much the same way as the *inhabitants* of the plain. The inhabitants of an area are the people who live in the area. You should remember this word because geography books use it many, many times. They say there are few inhabitants in a country, meaning that few people live there. They say that people *inhabit* a region, meaning simply that people live in that region.

The mountains of Shantung are barren and treeless. In the past they were covered with forests. But the trees were cut down long ago. Today the inhabitants burn kaoliang stalks to heat their houses. These stalks burn quickly. Also the people go out to the hillsides where bushes grow and gather twigs and small branches into bundles. They also dig up the roots of bushes for fuel.

Confucius, a great Chinese teacher whom many Chinese honor, lived in Shantung. Members of the very old family to which Confucius belonged still live there.

MANCHURIA

In some densely populated countries people can move from one area to other areas that are not so crowded. They occupy land in these new areas and make farms. But in China nearly all the regions with only a few inhabitants are too dry or too cold or too rough, or their soil is too poor, to make farmers want to move there. These thinly populated areas are producing barely enough food for the people who are already living there.

There is one large region, however, to which Chinese settlers have gone in great numbers. This region is Manchuria. The map on page 164 showed you where Manchuria is. Let us remember that it lies northeast of China Proper. It is outside the Great Wall. Notice also that it touches the coast.

How Manchuria got its name. Three hundred years ago only wandering herders of the Manchu tribe lived on the Manchurian Plain. Their animals grazed on the grasslands. Then some of these nomads went south into China Proper. They captured Peiping and made one of their men emperor. Manchu emperors ruled China until shortly after 1900. Finally they were driven off the throne. Because these people were called Manchus, we have given the name Manchuria to the part of Asia from which they came.

How Manchuria has been fought over. For many hundreds of years Manchuria was a part of China. After a long time it was divided into three provinces. These provinces were part of China just as Kiangsu is. Manchuria had few inhabitants until Russia built a railway across the northern part of it. Later many people, mainly Russians and Chinese, went to live in Manchuria. The Russians, of course, had to go south to reach Manchuria. The Chinese went north.

Across the Yellow Sea from China is the small country of Japan. The Japanese did not like to see Russian people settling in Manchuria. Japan wanted this land for itself. So for two years Japan waged war on Russia. The Japanese won that war.

PRESS ASSOCIATION, INC.

These pioneers came to Manchuria by train in 1932. Carrying their few belongings on their backs, they set out to make new farms and homes on the broad plain.

Then Japan sent soldiers to take over Manchuria and built railroads and opened mines. They wanted to get materials such as coal to use in their home islands. When Japan was defeated in World War II, Manchuria once more became part of China.

A region for pioneers. Perhaps you have read of *pioneers*, people who go into a land and open the way for others to follow. There are Chinese pioneers just as there have been American pioneers. Because the river plains of China have such dense population, millions of farmers have moved with their families to Manchuria.

Many traveled by sea. Some went on the railroads. Others journeyed on foot, pushing their belongings in a creaking wheelbarrow. If the family owned a mule, the animal helped to pull the heavy wheelbarrow. But some families did not even have a wheelbarrow. They had to carry everything they owned. They put their possessions into small packs and swung these packs from a stick over their shoulders. Many of these people knew little of the land to which they were going.

Until the coming of the pioneers the Manchurian Plain was grassland. Now, however, the settlers have plowed the land and planted fields in areas where once only the nomads lived. The settlers have gone mostly to the southern and central parts of the plain. The northern part is much colder.

The land is not so crowded with people as are the Yellow River Plain and the Yangtze Plain. The fields are larger. The farmers can therefore raise more food than they need. By selling extra food, they obtain money with which to buy other things that they need. They get a better living from the land than do the farmers on the densely populated plains.

The climate of Manchuria. The Manchurian farmers can do no farm work during the cold winter. From October to March the winds from the north bring cold dry air. From the end of November until the beginning of April the rivers are frozen over. For about four months the people can only sit by the fire and wait for spring. The days are short, and the wind is strong and chill. The skies are usually clear, and there are only light snows. The weather is dry also during the spring.

But when the short summer comes, moist winds blow from the south and the southeast. Rains pour down suddenly. The summer days are long, and the tem-

EWING GALLOWAY

Farming with machines on the Manchurian Plain. You can see that the land is very level. With machines these busy farmers can cultivate great stretches of farm land.

peratures are very high. Sunshine and regular rains make the crops grow fast.

By autumn the weather is dry again. Then the farmers begin to harvest their late grain.

The weather in Manchuria changes often. Sometimes in late autumn it is as warm as summer. Sometimes in the early summer the weather is cold. Even in a day the temperature may change greatly. Yet these sudden changes are not great enough to ruin the crops.

Farming in Manchuria. If you visited the Manchurian Plain, you would see that the farms are very different from the farms inside the Great Wall. The farms are much larger than those of the lower Yangtze Valley. On the rich black soil many farmers use modern farm machines. Manchuria is the only part of all China where the land is tilled by machines. Each farmer also has several animals to work for him. They may be horses and mules, or sometimes oxen and donkeys.

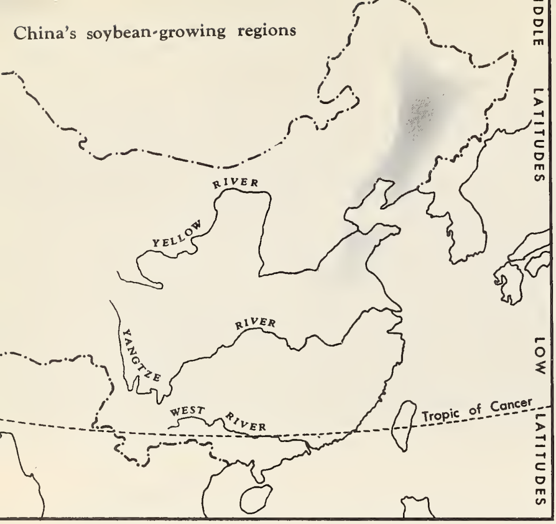
Because of the long, cold winter in Manchuria, planting is done only in the spring. The fields must be planted quickly because the growing season is short.

Very little rice is raised in Manchuria. One of the most important crops is kaoliang. It is the chief food of the inhabitants of Manchuria. The farmers produce so much kaoliang that they have some to sell to Chinese living in other regions. So kaoliang is also a commercial crop. And Manchurian farmers have *income* from its sale. Income is money that people receive for things they sell or for work they do.

For hundreds of years the Chinese have grown soybeans successfully. The new land in Manchuria where they have settled is well suited for growing this crop. Look at the map on page 176. The areas painted gray are those in which soybeans are grown. You can see that Manchuria is the largest soybean region. Are soybeans raised only on the Manchurian Plain or in the hills also?

Soybeans are one of China's most important commercial crops. Every year the farmers of Manchuria raise about three fifths of all the soybeans produced in the whole world. Some are sold to people living in Europe or America. There they are used not only for food but for oil. Some kinds of paint and soap are made from soybean oil.

The climate of Manchuria is very good for raising wheat. Large amounts are grown in northern Manchuria. In years when the crop is large, some of the extra wheat is sold outside of China.



Today large areas of Manchuria are still not settled. These areas are in the far north where the summer is very short or in the far west where the land is arid. But settlers are still moving to Manchuria. Within a few years most of the land will be inhabited by people from crowded parts of Asia.

Mountains and forests. Now let us look at the mountains around the Manchurian Plain. Those to the east are the most important. They furnish several products that are valuable to the people.

If you were to visit and climb one of these mountains, you would see many different kinds of trees. You could look down into wide valleys. Pioneers have gone into many of the valleys and made their farms there or on the gentle slopes. Tall trees grow along clear streams. During the winter the settlers hunt the wild animals that live in the forests. They want furs to sell.

A Chinese house in the hills of Manchuria. The walls are made of stone and mud.

JAMES SAWDERS — COMBINE

You will remember that the Chinese do not have enough wood for their needs. But this eastern highland produces fine timber. Lumbermen live in log cabins and cut down trees during the fall and winter. They haul the logs to the nearest streams. There they pile up the logs on the banks of the streams and leave them until the streams are no longer frozen over. In spring and summer the logs are floated downstream to the nearest railroad.

But even in these highlands more people work at farming than at any other occupation. The farmer uses the level land in the valleys or clears the stumps or stones from a hillside. Often he has a farm with a bit of woodland, a steep hillside field or two, and some level valley land. He and his family live in a log hut, furnished quite simply. The farmer does not use machines as does the farmer on the Manchurian Plain. Instead he uses an ax, a homemade plow, and some bent sticks as farm tools. Perhaps he has an ox or a horse, some hogs, or a few sheep. His animals are allowed to roam through the forest.

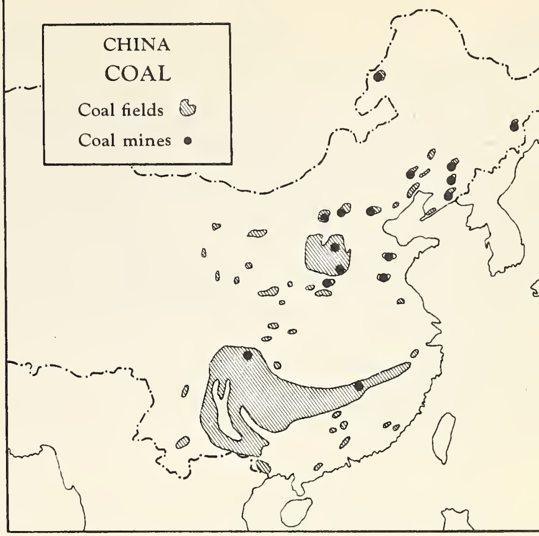
Farming here is not easy. The soil on the slopes is rapidly washed down the hills. Crops planted in a valley may be swept away by a summer flood. Yet the farmer manages to raise subsistence crops of soybeans, millet, wheat, and kaoliang. He can afford few things that must be brought from the outside world. He and his wife must either make what they need or do without.

Coal from the mountains. When pioneers visit a new area, they do exactly what you would do. They explore the area to see what valuable things they can find. They look over the land to see what crops might grow there. They study the soil and the water supply, for they want to grow the right crops. Then they look to see what timber the land produces. Those things that nature furnishes for our use are called *natural resources*. Soil and water and forests are natural resources. In the Manchurian mountains the settlers have found coal.

You know, of course, that in some countries coal is burned in furnaces to heat houses. Coal is also used in making iron. Iron ore as it comes from the ground is a mixture of earth and rock holding much iron. Men melt this ore to get pure iron. Melting iron ore takes a very hot fire. Coal is used as fuel for the fire. Coal is also used to drive engines that work for man. When pioneers find a region having much coal that can be easily mined, they know that they have a valuable natural resource. Coal is found in the mountains of Shantung, in the mountains southwest of the Manchurian Plain, and in the mountains of southeast Manchuria.

Look at the map on this page, which shows where there are *coal fields* and coal mines in China. A coal field is an area where there is coal under the ground. You can see that the country has much coal. About half of all China's coal comes from the mountains around Manchuria. Much also comes from the eastern part of Loessland.

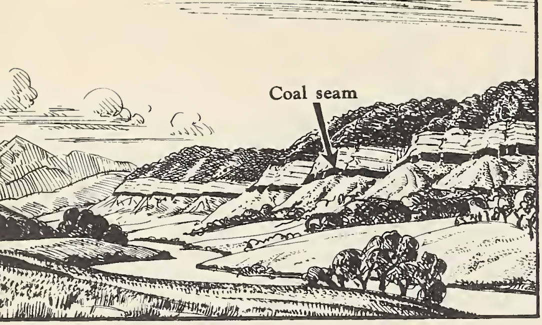
Coal is found in layers, called *seams*, and is dug out of the earth by miners. On page 178 you can see a coal seam that comes to the surface on the sloping side of a valley. This thick seam of coal leads down inside the hill, dipping deeper and deeper below the ground. Men mine the coal by digging tunnels in the seam.



Many coal seams do not come to the surface of the earth. Before men can reach the coal, they must dig a hole down into the earth. Next they must dig tunnels sideways from the hole into the seams of coal. As the men follow a seam, the tunnels may get very long. The picture on this page shows several coal seams on the slopes of a great pit. You can see the entrances to the tunnels, and

A coal mine in Manchuria. You can see the coal seams slanting up the sides of the pit.

EWING GALLOWAY



This drawing shows how coal seams appear on the side of a hill. Usually from the hillside they will slant deep into the earth.

the car tracks leading to them. Cars loaded with coal are moved along these tracks. You will learn more about how coal is used, in your later study of geography.

You might think that the Manchurian coal would be cheap because the miners are paid low wages. But it is really expensive to mine this coal. Few Chinese miners use machines to help with the work. They work very hard to obtain only a little coal. Also, the coal fields are distant from the densely inhabited parts of the country where fuel is needed. So it costs a great deal to get the coal there. The coal has to be sold for a price high enough to cover this cost.

LOESSLAND

Now we shall go to the dry Loess Highland. Find this region again on the map on page 164. The land looks as if loess had been sprinkled over it from a giant flour sifter.

Loess is not so coarse as sand. It is dust blown off the western desert onto this highland. It looks like a yellow powder. When the loess is wet, the grains stick closely together.

In Loessland most of the hillsides are bare without trees. Trees are found only in parts of the mountains which are hard to reach. In most other places the trees have been cut down.

Floods. What would you expect to happen in a highland having a fair amount of rain but little vegetation? Floods, of course. There are often dangerous floods in Loessland and there are great areas of waste land. Since loess is soft, deep gullies have been cut in the land.

Earthquakes. Many earthquakes occur in this region. During an earthquake the earth sometimes trembles enough to shake down buildings. Thousands of people may lose their homes and even their lives. About thirty years ago a terrible earthquake happened at night in Loessland. Hillsides of loess slid down into the valleys and buried whole villages. About three fourths of all the inhabitants were killed.

Houses in Loessland. Millions of people live in Loessland, though it is not densely populated. The people do not live as close together as they do on the Yellow River Plain. There are no large cities in this area.

The families live mostly in caves carved in banks of loess, for there is little wood to build houses. These dwellings are cool in summer and warm in winter. Doors are fitted to the openings and there are passages that lead from one room to another. There are few windows. On the level land above these caves the farmers cultivate their fields and grow their crops.

The people have few pieces of furniture. They can carve shelves and benches out of the walls of their rooms. They can make their beds on a wide shelf of loess. If they wish to have another room, they can cut away the solid loess until the space is large enough to live in.

Farming in Loessland. These Chi-

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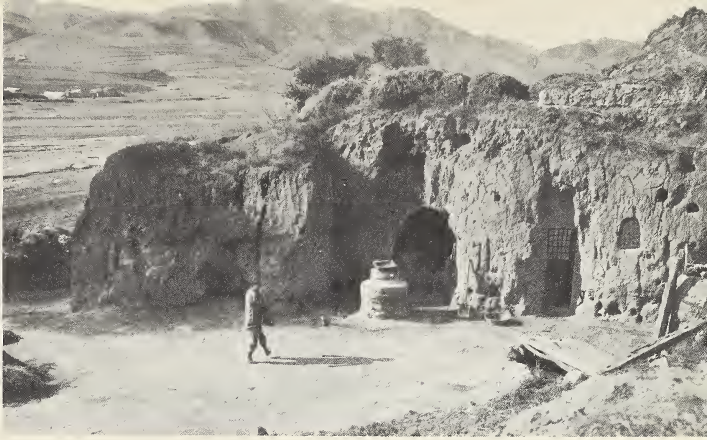
This house is carved in a bank of loess. The entrance on the right is fitted with a door. A storage cave is at the left. In front of the cave is a hand mill used for grinding grain.



nese too are farmers. In summer they grow millet and kaoliang in the fertile loess. In winter they grow wheat. These three kinds of grain can be grown in dry climates. Sometimes, however, there is too little rain for even these crops. Then there is a famine, and many people may die for lack of food.

The loess farmers also raise some commercial crops — cotton, tobacco, and perhaps *opium poppies*. The opium poppy is a tall plant that grows in the Old World. It does not have to be planted year after year. Instead it comes up each spring. It has white or purplish flowers. From these flowers a juice is obtained, which is called *opium*. It is used in making drugs. Because opium is valuable and easily transported, opium poppies are often raised in parts of China where transportation is very expensive.

In such fertile soil as loess, crops can be raised year after year without adding fertilizer. Winds bring new soil to the fields, much as the floods of the Nile River used to leave rich mud on the fields along its banks. If this region had more rainfall it would be one of the fine farming regions of the world.

Roads in Loessland. Roads which pass through Loessland are like narrow canyons. Every cart or pack animal stirs up the loess on the road. Because the dust is so light, it rises in clouds and floats away. A strong wind can lift up the dust and blow it away, even if there are no travelers on the road. The loess is also washed away by the rain. The roads have been worn down by the wind and rain until now they lie below the level of the countryside. In many places they are barely wide enough for a single cart to pass. The sides rise straight up like high walls. Travelers within these walls may journey for miles without seeing the surrounding country.

THE DESERTS

The Yellow River Plain, Shantung, Manchuria, and Loessland all put together make up less than half of North China. The great steppes and deserts of Inner Mongolia and Sinkiang cover the largest part, reaching more than 2000 miles westward across Asia. It takes almost half a year for a camel caravan to cross the desert from east to west. A month or more is needed to cross it from north to south by caravan.

Shepherds of Mongolia. You will remember that the Great Wall was built

MELVILLE JACOBY FROM GUILLUMETTE

Farming in Loessland. Loess is very rich soil, and, where there is enough rain, will grow fine crops. But the farmers always fear drouth, for drouth sometimes causes famine.

by the Chinese to keep out the nomadic shepherds coming from the north. Primitive herders still live in Mongolia today. But they are becoming fewer and fewer. They move about on the windy, dusty steppes trying to find pasture for their flocks of sheep, goats, and other animals.

The sheep are the most useful of the animals raised in Mongolia. They provide warm wool for covering tents and thick sheepskins for clothing. The winter is icy cold and lasts many months. In winter the shepherds can kill sheep and have mutton to eat. During the short, hot summer they have goat's milk, cheese, and butter. They may even store some cheese for winter. Sometimes the shepherds buy a little barley, millet, flour, or tea from passing caravans or from the inhabitants of the oases. But products from the sheep are their chief foods. The women do the work of milking the animals and preparing the food.

The *Mongols*, as these shepherds are called, never walk if they can ride. They have small horses which can travel at great speed. When wolves carry away a few sheep, a tribesman may set out to kill the wolves. He thinks nothing of riding for many hours without rest.

Moving to new pastures. Wherever the nomadic families find good pasture, they stop until the pasture is used up. They pitch their tents and herd their animals on the best grazing land. After the animals have eaten all the grass that grows in the neighborhood, the shepherds fold their tents and leave. They drive their herds before them in search of new pastures. Behind them on the desert are only the half-burned sticks of their camp fires and a few bones.

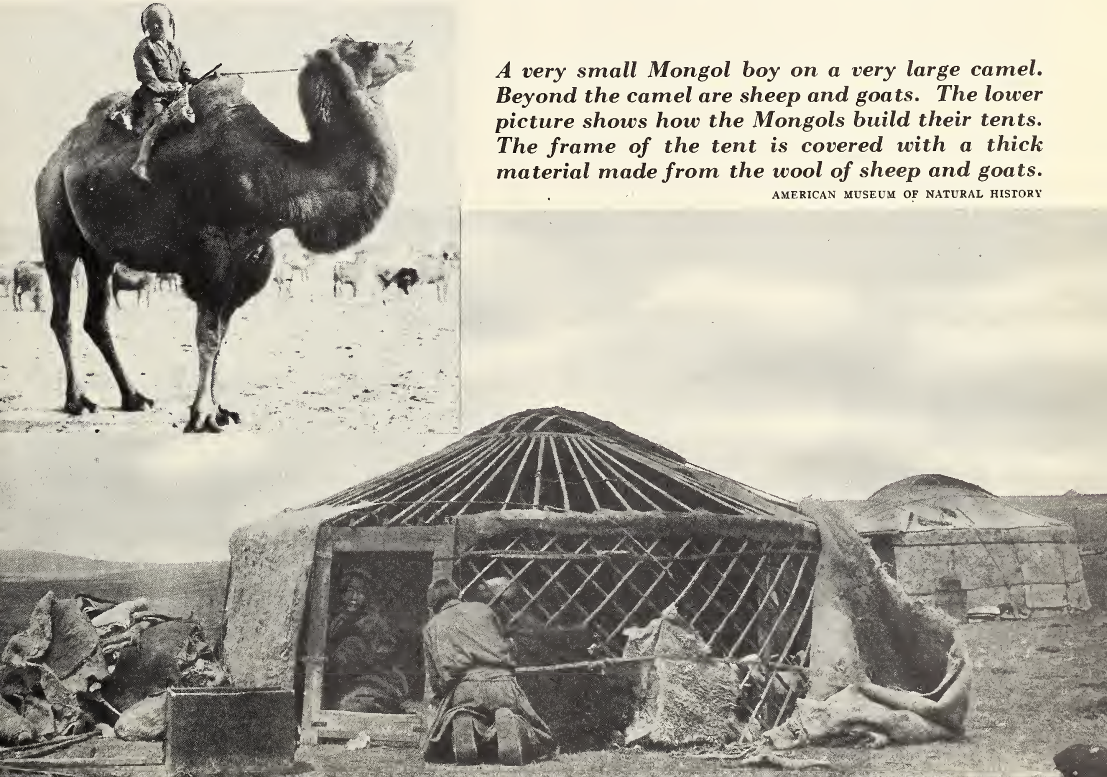
The Mongols move about often because showers may come in only one part of the desert. The Gobi Desert is very different from tropical deserts. Rainfall comes in showers or a long drizzle, not in a great downpour.

Time after time there has been enough rainfall outside the Great Wall to grow crops. Then the Chinese farmers would go a hundred miles or more into Mongolia. The nomads would go farther north because the wetter weather made rich grass grow on the steppes. When the rains failed, the farmers would go south again. The nomads would move nearer, even coming to the cultivated land within the Great Wall.

Transportation. On the steppes people travel on horses, mules, and oxen, or in carts pulled by these animals. On the more arid desert the camel is the only animal that can be used. But it is not the Arabian camel used on the Sahara. The camel seen on this desert has two humps and longer, shaggier hair. It can stand more cold. Therefore it is used in the deserts of central and eastern Asia, where the winters are cold. The padded feet of the camel can travel easily over the soft sand without sinking in. The animal can go without water for many days. Its humps consist almost entirely of fat, which will keep it alive if it must go without food for a long time.

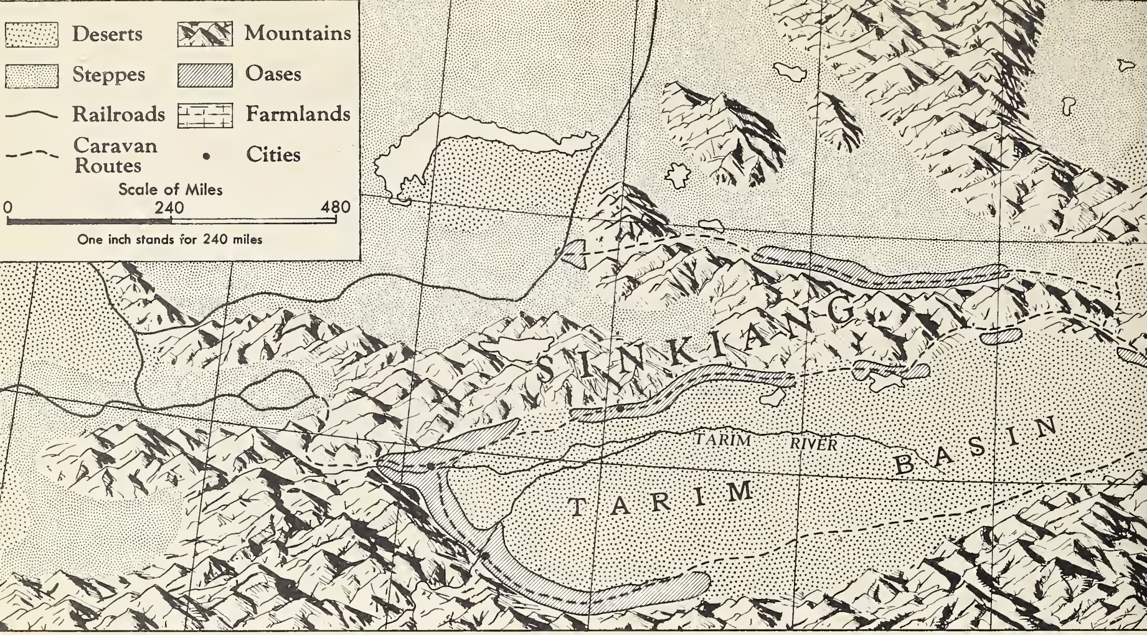
Oases. There are no cities on the desert except around its edges. Here and there in this barren land are scattered oases. Caravan routes lead from one oasis to another. Although travelers on a desert carry water bags, they must always know where they can get water. The caravan leader must be able to find his way from one water hole to another. The travelers may run out of water if they lose their way in a storm. They may come to an oasis and find that it has gone dry. Then they know that they may die of thirst before they can reach the next oasis.

These oases are villages. They have grown up wherever water can be obtained from wells or springs or mountain



A very small Mongol boy on a very large camel. Beyond the camel are sheep and goats. The lower picture shows how the Mongols build their tents. The frame of the tent is covered with a thick material made from the wool of sheep and goats.

AMERICAN MUSEUM OF NATURAL HISTORY

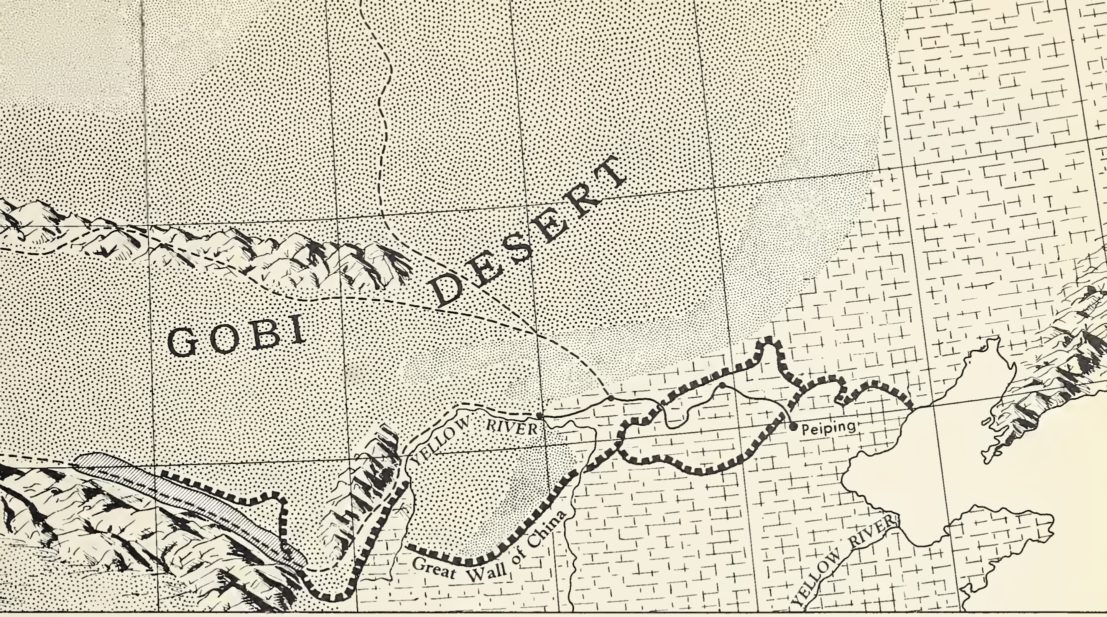


streams. These villages are separated from the outside world as if by an ocean, an ocean of dry land rather than of water. The people of the oases make their living by raising the usual crops of North China. Remember that these crops are not rice but wheat, kaoliang, millet, and beans. The oases are trading centers. Caravans plod slowly from one oasis to another. If all the oases where a caravan can stop could be put together, they would cover only a very small area of land. Yet more than half the people of the desert live in these oases.

Routes across the deserts. This map was drawn so that you can see the routes across the great Chinese desert. It shows the great deserts and steppes in North China and the land lying next to the deserts. Find the large, old, and interesting city of Peiping about which you have read. This city, you remember, is near the northern edge of the Yellow River Plain inside the Great Wall. See the railway that leads westward from Peiping. Most of the caravan routes into the desert start from the small cities along the southern border of Inner Mongolia. Follow these routes on the map and see where they lead.

Notice the southwestern edge of this great desert. Here runs the great highway of central Asia. Even in earliest times, when the Chinese traded very little with other people, silks, gems, and other goods passed from merchant to merchant over this highway. The road passes from one oasis to another along the foot of the mountains. Then it crosses bare desert to a beautiful oasis in eastern Sinkiang. Here the road divides, one trail going north, the other south.

Sinkiang. Now look at Sinkiang on the map on page 164. Sinkiang is in the far western part of China. It is a great, barren plateau with mountains on all sides. Much of the region is steppe. Therefore the Mongol herders use the land to raise sheep for wool and hides. Yet some very beautiful and valuable things come from parts of Sinkiang. Let us see what they are.



Find on the map the part of this plateau which is drained by the Tarim River and its branches. This part is the Tarim Basin. In the fertile oases around it grains, fruits, and vegetables are raised with the help of irrigation. *Jade* and gold are mined in the mountains. Jade is a beautiful hard stone, generally apple green in color. It is used to make many kinds of ornaments.

In the larger towns silk, carpets, leather goods, and copper articles are produced. The hair of sheep and goats is sold to rug-weavers. The rug-weavers are not nomads. The beautiful oriental rugs cannot be made in a week or a month. The large frames on which the threads are strung cannot easily be moved. These soft-colored rugs made of silky wool are shipped to many parts of the world. Wealthy people pay large sums of money for rugs that have been made in Sinkiang.

The Silk Road. Sinkiang has the only low passes between China Proper and western Asia. Since earliest times caravan routes have led from old China through the passes of Sinkiang to Europe. This was the route of Marco Polo, a young explorer who more than six hundred years ago crossed Asia from west to east and back again. He traveled only a few miles each day, because he had to walk or ride horses or camels all the way.

From Sinkiang men took jade to China Proper. They brought back silks and *porcelain*, which is the finest kind of clay ware. Because so many caravans transporting silks used this road, it came to be called the *Silk Road.* This road followed the southern edge of the Tarim Basin. Today many of the towns are in ruins, and the route of the Silk Road crosses barren country.

Life in deserts is found almost entirely at the oases, for the inhabitants must have a water supply as well as food. Trade routes have always met at oases. But around the oases the barren land stretches away for miles and miles. Traveling in a caravan, one may not see other people for many days.

Working and Playing

Any great or sudden misfortune is called a *disaster*. In this chapter you have read of three kinds of disasters that people fear in certain parts of China. Name each kind of disaster and explain where and how it has happened.

TESTING YOUR UNDERSTANDING

1. In this book you have read about several dry lands: the Sahara in Africa, the Navajo country in southwestern United States, and the Gobi Desert in Asia. Try to remember what you have learned about each region. Then answer these questions:

   a. Are the dry lands thinly or densely settled?
   b. Are the people scattered evenly or unevenly over these lands? Why?
   c. Do the nomads who live there make great changes in the land or changes that last only a short time?
   d. What important changes have men made in some of the dry lands?
   e. What happens in dry lands when more rain falls than the usual amount as shown on the rainfall map?

2. What vegetation would you expect to find along the edges of the Gobi Desert?

3. Why is coal a valuable resource?

4. Think of the farms on the Manchurian Plain and those in the lower Yangtze Valley where rice farmers live. Does a Manchurian farm have more or less rainfall than a farm in the lower Yangtze Valley? Are the winters as cold and the summers as warm as in the Yangtze Valley? In which region are the farms larger? What crops are grown in each region? What methods of cultivation are used? Is the farmer on the Manchurian farm usually richer or poorer than the farmer in the Yangtze Valley? Why?

5. In what ways are the farms of the Yellow River Plain like those of the lower Yangtze Valley?

GIVE THE BEST REASON

1. The Yellow River is yellow because: (*a*) yellow fish live in it; (*b*) the sun is yellow; (*c*) it carries much yellow soil.

2. The Yellow River changes its course because: (*a*) men have built dams which stop it from reaching the ocean; (*b*) mud fills up the channels; (*c*) the farmers have not built dikes.

3. The best way to use the Yellow River for irrigation would be: (*a*) to build dams; (*b*) to build higher dikes; (*c*) to break down all dikes.

4. Travel is difficult in North China because: (*a*) there are no automobiles; (*b*) the roads are poor; (*c*) men like carts better than trains.

5. Floods are usually caused by: (*a*) too many trees; (*b*) lack of vegetation; (*c*) lack of dikes.

6. Manchurian coal is expensive to mine because: (*a*) wages are high; (*b*) the coal is found in very deep mines; (*c*) the miners do not use machines.

7. People in Loessland live in caves because: (*a*) they like caves better than houses; (*b*) they do not know how to build houses; (*c*) they have no wood.

MAP STUDY

1. Locate and name on a map of North China:

   a peninsula
   the most important river
   two densely populated plains
   a large desert
   two important cities

2. Trace the Yellow River from its source to its mouth, telling what you know about different parts of its course.

3. Name the parts of Outer China in the north and tell at least one fact about each part.

MAKING SENTENCES

Here is a list of words you know. Below are sentences with one word missing. Write the sentences, filling in the right words from the list. (*Do not write in this book.*)

natural resources
inhabitants
kaoliang
oases
drouth
opium
dredging
soybeans
caravan

a. In North China farmers raise a very tall grass called ____.

b. Paint and soap, as well as food, can be made from ____.

c. A time when there is no rain for many weeks is called a ____.

d. Cleaning out the bottom of a river is called ____.

e. All the useful things that nature furnishes are called ____.

f. The drug made from the juice of poppy flowers is ____.

g. Places in the desert where there is water and where routes cross are ____.

h. A group of people crossing a desert with camels is called a ____.

i. All the people who live in an area are called its ____.

A WORD GAME

In the left-hand column is a list of words. In the right-hand column are groups of words that tell what the first words mean. Match the two columns.

channel	a time when there is no food
loess	the grassy border of a desert
famine	the bed of a river
steppe	fine yellow dust
pass	a break between mountains
seam	money people get for work
income	a layer of coal

DO YOU KNOW THESE WORDS?

porcelain
river course
navigable
commercial crop
surplus
product
route
export
iron ore
earthquake
disaster
inhabit

ARE YOU A GOOD DETECTIVE?

A good detective can find and understand clues, or hints. Can you find clues in the picture on page 167 which will help you answer these questions:

1. How can you tell that this part of China sometimes has cold weather? Find two clues.

2. Even if there were no words under the picture, how could you tell that this village is not in Loessland?

3. In what ways are Chinese houses like our houses?

4. What time of year might this be? (Clue: Do the leaves look full grown?)

5. Do you suppose there are many automobiles in this village? (Extra clue: What is the road like?)

6. Special question: Why do you think at least some of the people in this village can read?

ANDERSON (CNS) FROM GUILLUMETTE

Working with cotton in South China. The woman is winding cotton yarn on a small spool. From the yarn she will weave cotton cloth in her home and make clothing for her family.

South China

Most boys and girls like to go on a trip just as grown people do. Only a few of them can visit distant lands. But everybody can visit other lands in books and find out many new and interesting things about far-away places. When you go on a hike, it is necessary to follow your leader. On this trip you will follow either your teacher or this book. Keep your eyes open. Ask questions about the land and the people. Then you will learn about this great world in which you live.

Our trip by map through North China ended in the Tarim Basin in Sinkiang. Soon we shall leave western China and cross the country from west to east through South China. But before we go, you should remember what you have already learned about farming in China.

You have read about the rice farmers

in the Yangtze Valley, and you know that the densely populated parts of South China are very different from the plains of North China. The fields are flooded at times, and there are many canals. South China is a green, wet riceland. The north, you remember, is a wheatland.

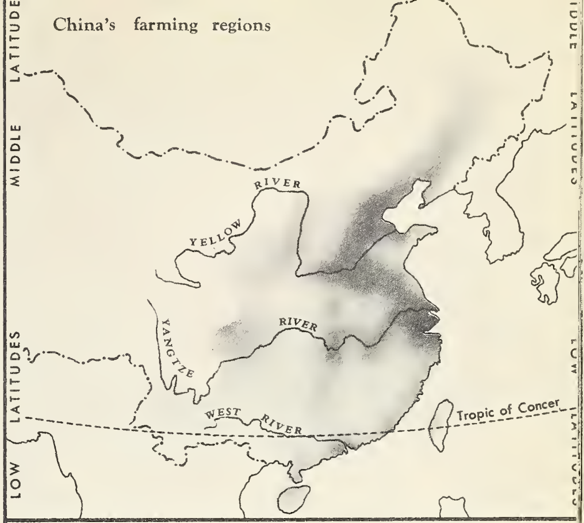
These three maps tell you much about farming in China. The first map shows the areas where people have farms. The darkest areas are those where there are the most farms. The light gray areas are those where there is some farming, but not very much. The land area that is left white has no farms at all. This land is too rough or too dry or too high and cold for farming.

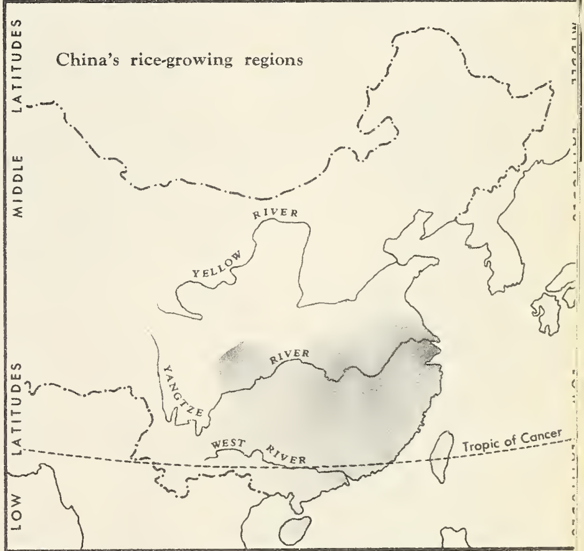
On the first map find two great rivers you have read about. Notice that the darkest areas are the plains and deltas of these rivers. Tell why these areas have many farms. The dark spot about in the center of the map is the Red Basin, where there is much farming. West of the Red Basin, along the edge of the plateau of Tibet, there are a few small farms and gardens. But in most of western China no crops can be grown.

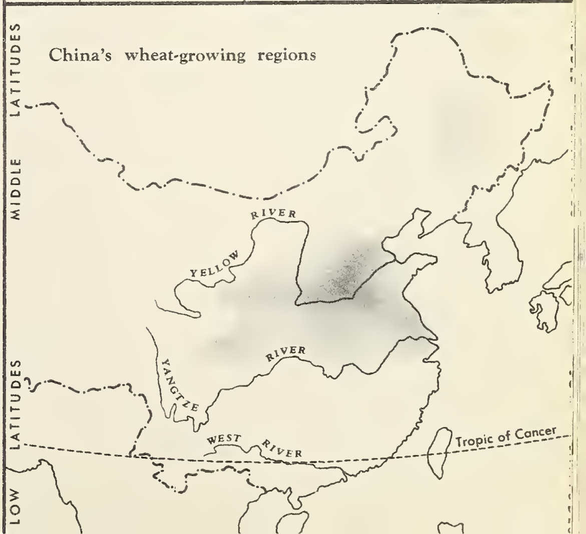
Now look at the second map. In the areas that are dark on this map, rice is the main crop. In the light areas, only a little of the farm land is used to raise rice. In the south most of the land is used for rice.

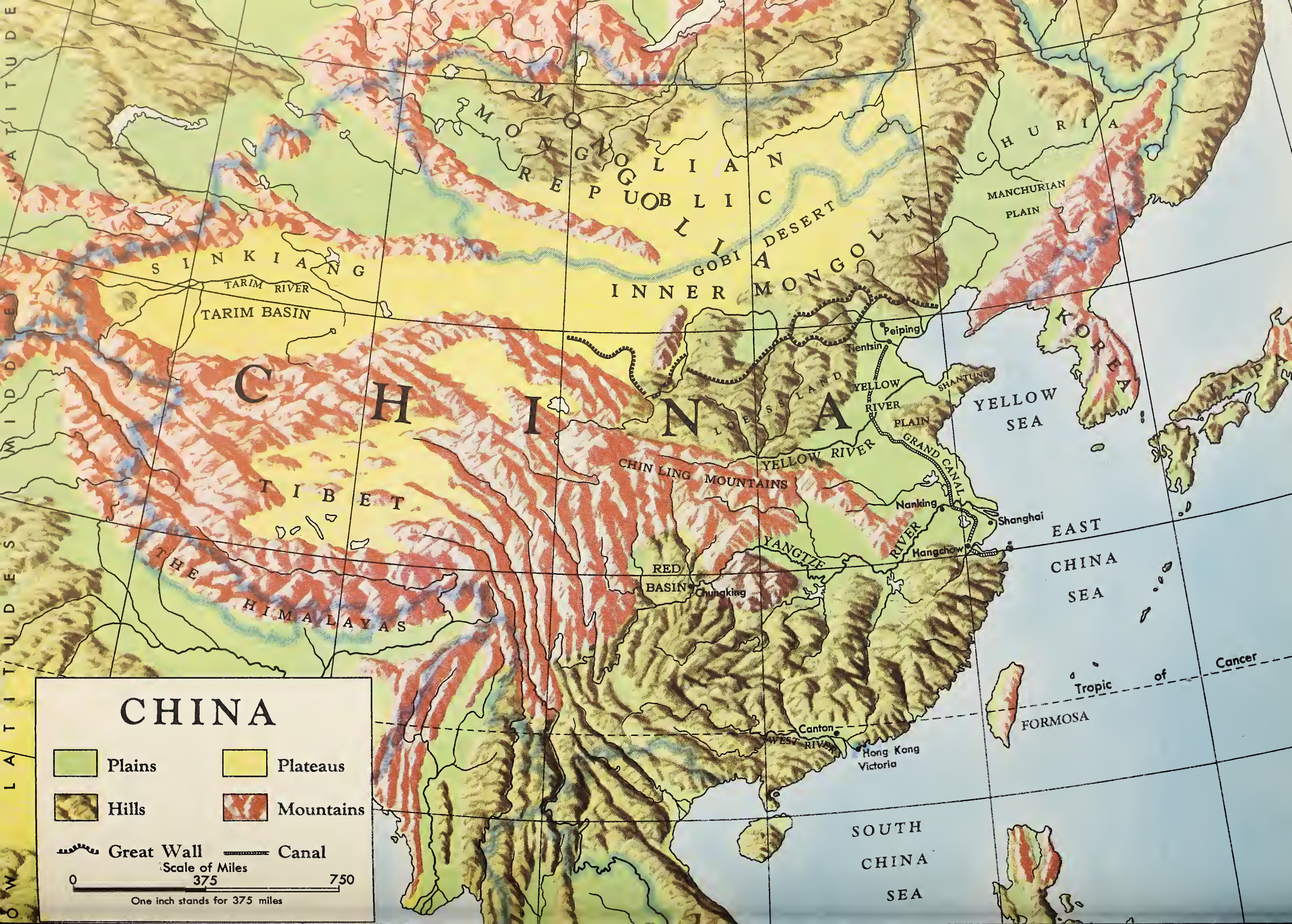
On the third map you can see where wheat is grown in China. Which region raises more wheat, North China or South China? From what you know about rainfall in China tell why this is so.

Now look at the second and third maps and find the areas which produce large crops of both wheat and rice. These crops use the same land. The farmers grow rice in summer and wheat in winter.


China's farming regions


China's rice-growing regions


China's wheat-growing regions


CHINA
Plains
Plateaus
Hills
Mountains
Great Wall
Canal
Scale of Miles
0
375
750
One inch stands for 375 miles
MONGOLIAN REPUBLIC
MONGOLIA
GOBI DESERT
INNER MONGOLIA
MANCHURIA
MANCHURIAN PLAIN
KOREA
JAPAN
SINKIANG
TARIM RIVER
TARIM BASIN
CHINA
TIBET
THE HIMALAYAS
LOESS LAND
Peiping
Tientsin
YELLOW RIVER PLAIN
SHANTUNG
YELLOW SEA
GRAND CANAL
YELLOW RIVER
CHIN LING MOUNTAINS
Nanking
Shanghai
Hangchow
RIVER
YANGTZE
RED BASIN
Chungking
EAST CHINA SEA
Tropic of Cancer
FORMOSA
Canton
WEST RIVER
Hong Kong
Victoria
SOUTH CHINA SEA
MIDDLE LATITUDES
LOW LATITUDES

Around South China by Map

Look at the map of China on the opposite page. Locate the Tarim Basin. Find the very high, cold plateau of Tibet to the south. Why is it cold on this plateau? The very southern part of Tibet is in the low latitudes. Notice on your globe that southern Tibet is no farther from the equator than the delta of the Nile. Yet Egypt is a warm land, and Tibet is a cold one. Tibet is cold because it rises much higher above the surface of the sea than Egypt. In very high places it is always cold.

Notice the Himalayas on the southern border of Tibet. Between what countries do they lie? Towering ice-covered peaks rise up from the high plateau.

Now look east of Tibet toward China Proper. How many rivers do you see crossing China? In which direction do they flow to reach the sea? It would be impossible for these rivers to flow toward Tibet. Why?

The course of the Yangtze River. Two of China's great rivers are in South China. What are their names? Follow the Yangtze down from Tibet along the southern edge of the Red Basin. It was named Red Basin because of the reddish color of the soil. Living in the basin are many farmers and their families. They cultivate farms in this area of gentle hills and small plains. In whatever direction they look, except southeast, they see high mountains around the basin.

In the Red Basin there is also a very old city which you will read about later. What is its name?

See the mountains separating the Red Basin from the Yangtze Plain. Notice where the Yangtze comes out of the mountains and the plain begins. This plain is low land even in the west. At first the plain is narrow on either side of the river. Soon it widens out, especially to the north of the Yangtze. Then, farther east it becomes narrow again, winding between the hills. The river becomes wider and wider as it nears the sea. Finally it reaches its delta. Which is larger, the Yangtze Plain or the Yellow River Plain?

At the mouth of the Yangtze is a very large and well-known city. People all over the world know about this great Chinese city. Goods are received and shipped through it to other parts of China and other parts of the world. What is its name?

Another large river. Notice the highlands south of the Yangtze Plain. This rolling country has strips of level land only along the rivers. Find the West River. It is the most important river that flows down through these highlands. Like the Yangtze delta, the delta of the West River is densely populated. How would you expect the Chinese to use these level strips of land?

The southeast coast. Along the southeast coast of China the families do not make their living by farming only. Thousands of small junks go out into the open sea to catch fish. Since these small boats do not carry ice, they must return to land each day with their catch. The fish must be sold quickly before they spoil. The southeast is the most important fishing region of the entire coast.

Place your finger on the delta of the

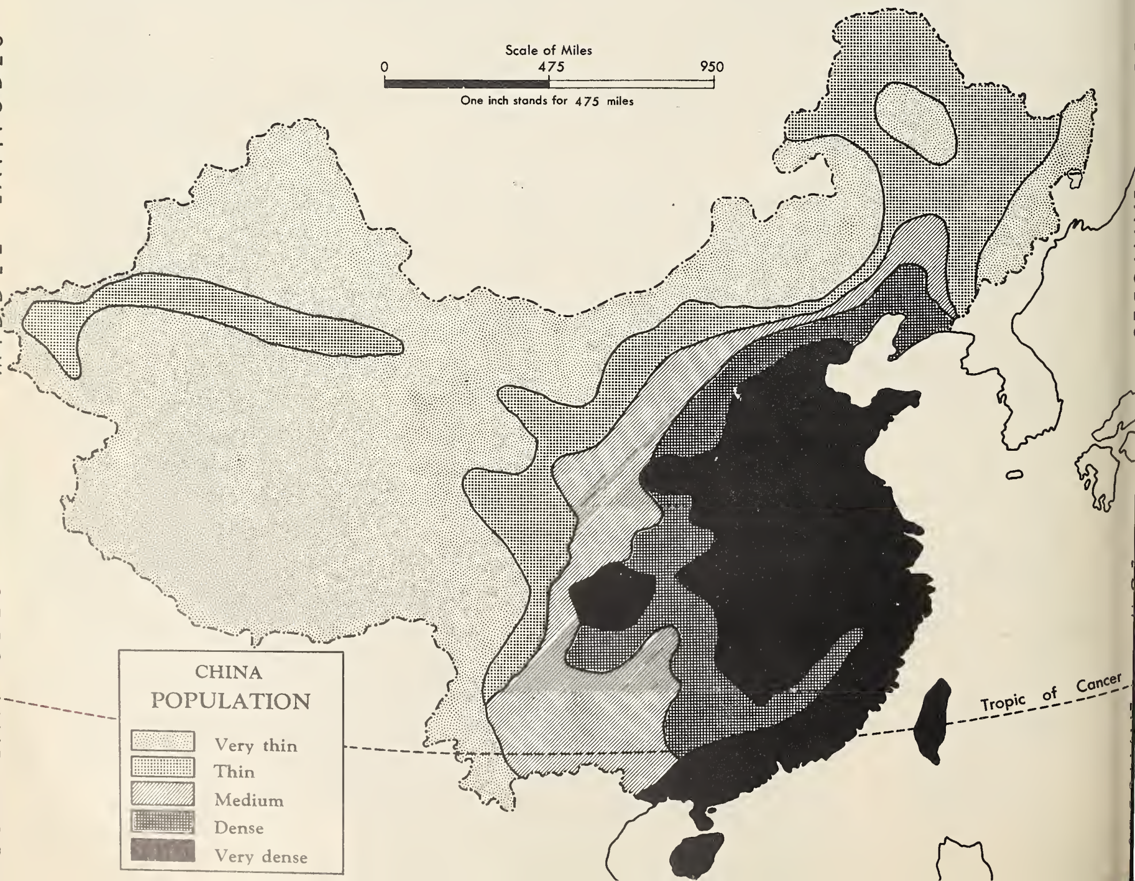
West River. Follow the coastline to the mouth of the Yangtze and then northward to Shantung. You are now back where you started on your visit to North China.

The population of China. You remember that China has a larger population than any other country in the world. This map shows where the people of China live. How is very thin population shown on this map? Very dense population? How is population shown which is neither thin nor dense? In what part of the country do most of the Chinese live? What areas are densely populated? Why are these areas so crowded? What areas are very thinly populated? From what you have read about China, explain why certain areas are thinly or very thinly populated.

ACROSS SOUTH CHINA

Tibet. Imagine that you are walking on the high, cold plateau of Tibet in winter. You are wearing boots and clothing made of furs. The weather is very cold, but the sky is clear and deep blue. You wear dark glasses to protect your eyes from the glare of the sun. The sun is so bright that your face is sunburned. At the same time your feet are quite likely to be frost-bitten.

What would you see in Tibet? Off to the east are snow-clad mountains and deep gorges. Around you many peaks with glaciers rise thousands of feet in the air. You might not see any people at all. Tibet, you know, is a very thinly settled region. Perhaps you might see a



EWING GALLOWAY AND GUILLUMETTE

The first two pictures were taken in Tibet. The upper picture is a view across the plateau, showing a deserted village and the Himalayas in the distance. The women in the second picture are cultivating wheat on a small farm plot. The lower picture shows farmers in the Red Basin threshing wheat.

few nomads driving herds of yaks and goats to grazing lands.

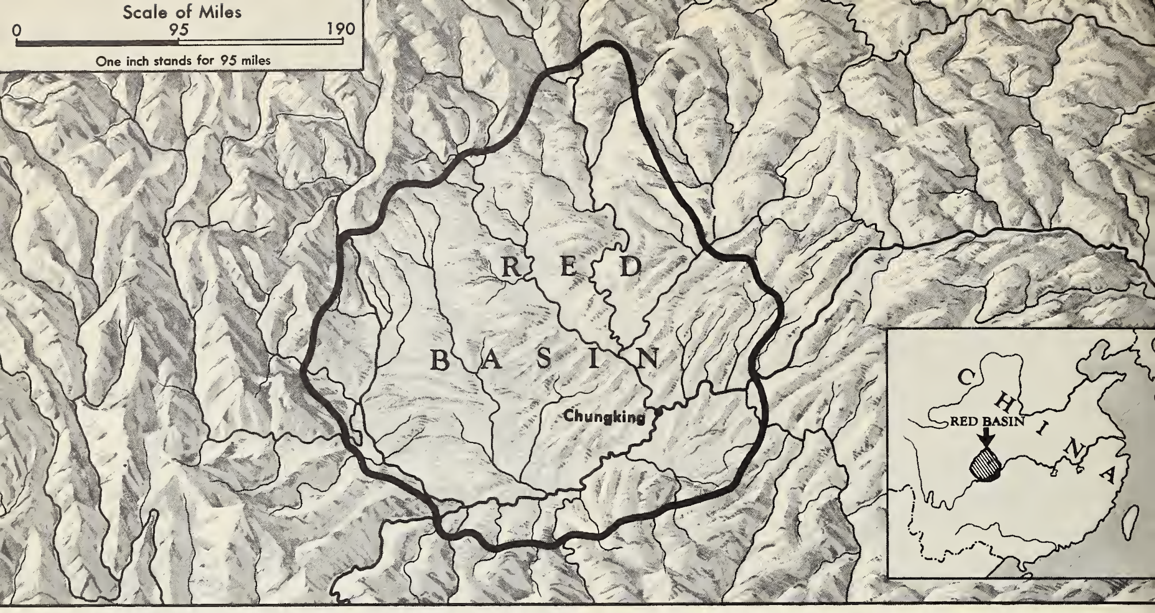
The yak is a wild ox. It can live in the cold, dry air of the high plateau and mountains. You can hardly see its legs for the long, heavy, black hair. This warm coat of hair protects the animal from the cold.

The sure-footed yaks are used for carrying heavy loads. They work even in the bitter cold of the highlands. Their milk is rich and makes good butter. Their long hair is used to make tent coverings and warm garments.

Much of Tibet has no vegetation. In many parts not even the nomads can live. The plateau is cut by deep valleys and crossed by mighty mountains. Only a few areas have enough warmth and rainfall for farming.

You could not visit all parts of Tibet. Some of the land is so wild and rough that no explorers have ever gone there.

The Red Basin. Long ago the Chinese learned how to make farms in every part of their country where rice can be grown. They plant crops even on land that would not seem to be good for rice growing. The Red Basin is a rice region. You saw that after the Yangtze leaves Tibet and starts to flow across China, it passes through this basin.



Here is a map of the Red Basin. Look at the little map of China to see exactly where the Red Basin lies. Now find the Red Basin on the map of China, page 188. Compare it with this map. Here the same area is drawn on a larger scale. The basin is shown much more plainly than it was shown on the map of all China. You can learn much more about the land from this map. Notice the scale of miles on each map. How can you tell that this map is drawn on a larger scale than the map on page 188?

This basin is not level land like the Yangtze delta. The region is hilly, though not so rough as the surrounding land. There are steep valleys through which swift streams flow. In such a hilly region it is harder to grow rice than on the Yangtze Plain.

This is an area where much rain falls. The rolling hills are always green, for there is little cold weather. Oak and palm trees, which usually grow on lower ground, are found here, and there are many cypress and pine trees too. Travelers say that few parts of China are as beautiful as is the Red Basin. These travelers say that the Red Basin is really a green land.

Farming in the Red Basin. Crops are planted on the hills in any places to which water can be brought. Only on the very steep hills are there no rice terraces. On many hills there are terraces all the way to the top. These are just narrow strips of cultivated land joined by irrigation ditches. From the air they look like green ribbons lying on the ground.

Many different summer crops are grown in the Red Basin. Of these rice is the most widely raised. It is grown wherever the fields can be flooded. But the farmers also raise corn, sugar cane, tobacco, and vegetables. Where they cannot obtain water for irrigation, they plant millet and kaoliang. These crops do not need irrigation water.

The rice is harvested in September. Afterward the busy farmers prepare their fields for winter crops. In winter they grow mostly wheat and *rapeseed*. From the rapeseed an oil is obtained, which the villagers use in cooking.

Another oil produced in the Red Basin is *tung oil*, which comes from the seed of a tree. Much of this oil is shipped to the United States, where it is used in making paints and varnishes. This map shows where tung oil is produced in China.

Perhaps you have been wondering about the kinds of crops growing in this basin. Perhaps you have noticed that warm-weather crops are grown here. Such crops as tobacco and sugar cane cannot be raised in cold climates. Although the Red Basin is high above sea level, it does not have cold weather. All around it are high mountain ranges that protect it from the very high and very low temperatures. It has hot, rainy summers. In winter the weather is mild and dry.

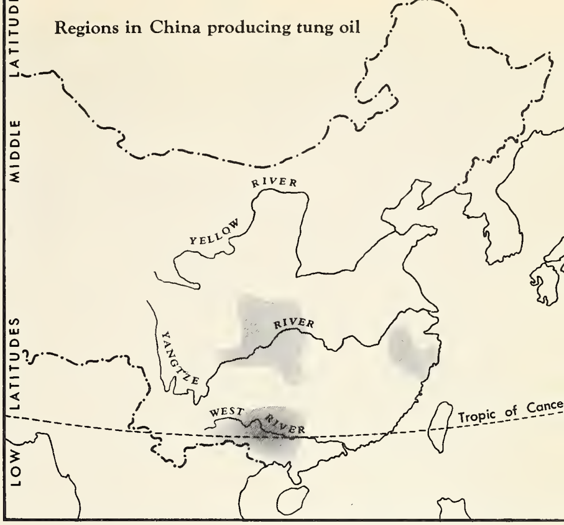
Minerals in the Red Basin. This basin has rich mineral resources. One of these is salt. Did you ever think, when you were putting salt on your food, that it is a mineral which comes from the earth? Salt is a natural resource of the Red Basin.

Salt comes from salt lakes, salt springs, salt wells, and salt mines. In the Red Basin it is obtained from wells. Some are about thirty feet deep. Others are hundreds of feet below ground.

The *brine*, or salty water, has to be pumped up to the surface. Then the salt in the brine must be separated from the water. In some countries such work is done quickly and easily by machines. But in the Red Basin slow, hard, primitive methods are used by the natives.

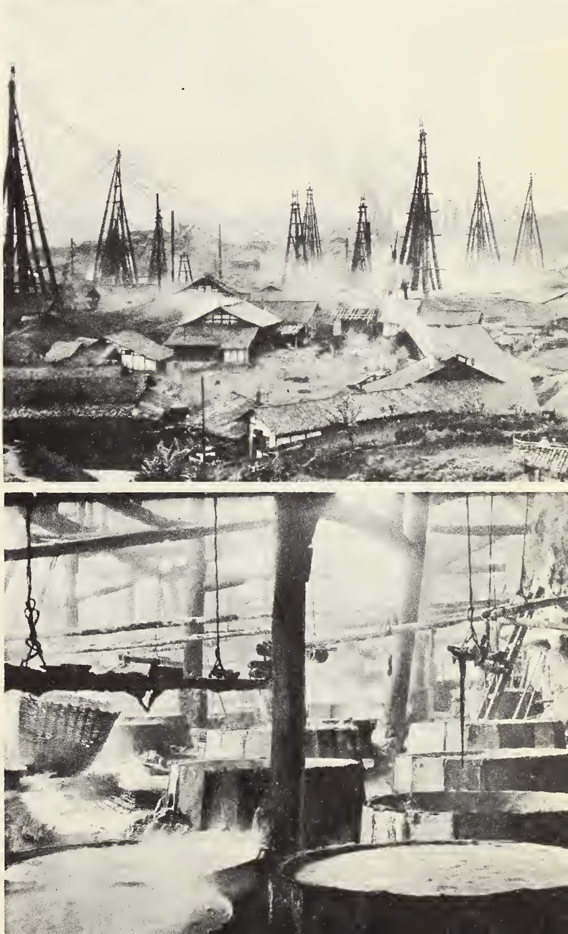
After the brine is brought to the surface, it is put into huge pans and boiled down over coal fires. When the water has evaporated, the salt is left in the pans. Every year a large quantity of salt is produced in this way.

Now you have seen that the Red Basin



Salt mining in the Red Basin. The upper picture shows derricks above the salt wells. The lower picture shows evaporating pans.

EWING GALLOWAY



has two valuable resources, good farming land and salt. Besides these resources it has coal and some iron.

Most of the coal is deeply buried in the earth. Think what a difference this makes in the cost of mining the coal. It cannot be obtained easily and cheaply.

After it is mined, it must be transported to the people who use it. Most of these people live in China Proper. Some of the coal can be shipped by rivers and canals. That is not very expensive. But much of the coal has to be carried many miles overland on the backs of coolies. This is slow and costly transportation.

The city of Chungking. Chungking is a very old and important city in the Red Basin. Find it on the map, page 192. During late years it has grown much larger than it used to be. Also it has suddenly grown modern. Why?

Not for the usual reasons. When you studied about Peiping, you learned that cities usually grow large because they are centers of trade. They are in a location where transportation routes meet. Chungking has become important for a quite different reason.

In Chungking, rickshas and modern buses travel side by side along a modern street.

ANDERSON (CNS) FROM GUILLUMETTE

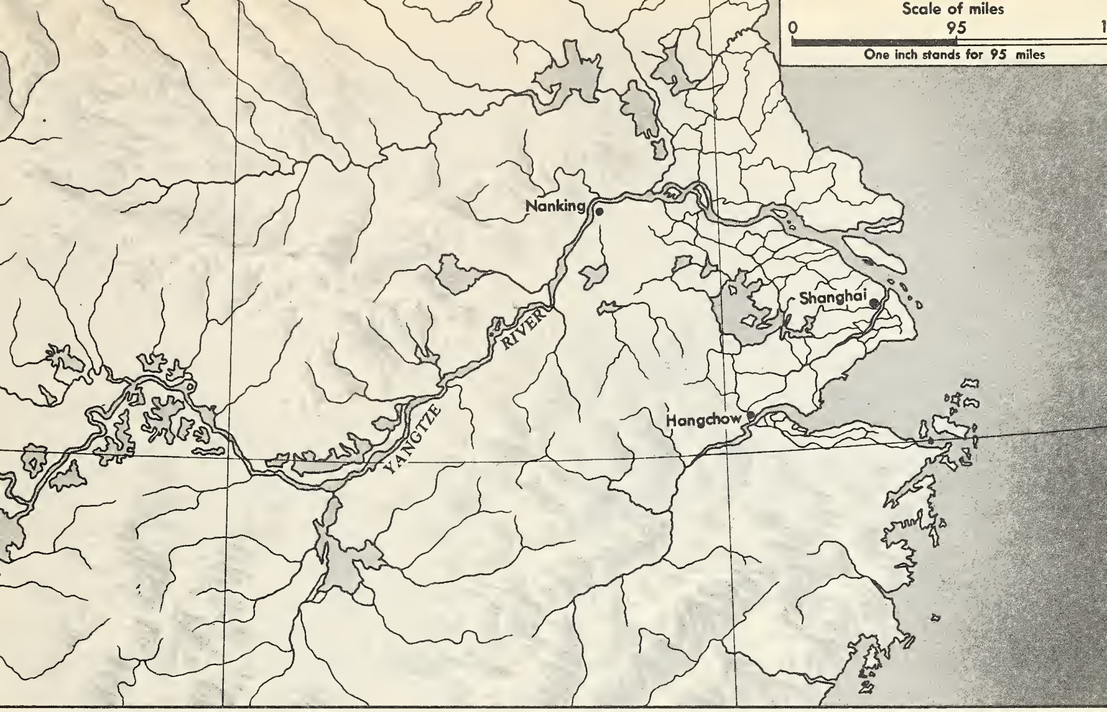
During World War II all the richest parts of China were occupied by the Japanese armies. Japan sent its armies westward across the Yellow Sea and into China. Its soldiers took the land with orders to stay as long as Japan needed an army there. They captured the Yangtze Plain, the Yellow River Plain, and Manchuria. War was fought over much of China Proper. Railroads were torn up. Later some were built again for the use of the Japanese.

Nanking had long been the capital of China. Find this city on the map, page 188. It is in the lower Yangtze Valley northwest of Shanghai.

During the war the Japanese wanted to capture China's capital city. Then China would have no center of government, and the Japanese could more easily conquer the country. So with much labor the Chinese moved their factories and universities westward to a new capital in the Red Basin. Students and large numbers of factory workers walked overland to reach the new capital — Chungking.

The Red Basin, you know, is surrounded by mountains and hilly lands. As the Yangtze reaches the mountains to the east of Chungking, it flows through a narrow gorge with steep sides. The Chinese knew that they were safe west of this gorge. Because it is narrow, they could keep the Japanese from passing through it and going beyond the mountains.

New streets were cut through the old parts of Chungking. Modern buildings took the place of old ones. New areas



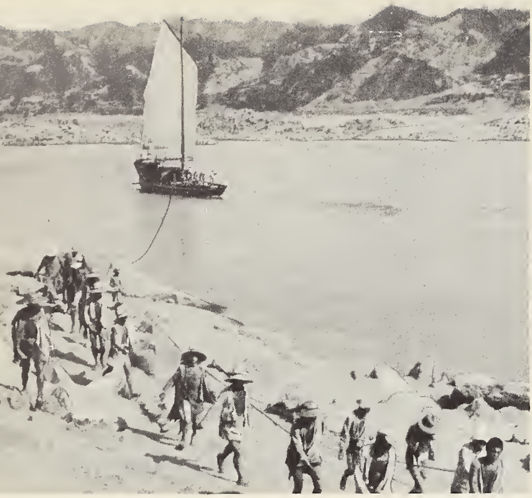
were built up. Today many automobiles can be seen in the city, though until recently not a single wheeled vehicle traveled on its narrow streets. Being near to rich natural resources, the city is becoming a center of trade. Perhaps it will continue to grow even though the capital has been moved back to Nanking.

The Yangtze River. This book has already told you some things about the mighty Yangtze, the longest and most important river in China. It is wide and deep and is one of the most useful waterways in the world. It flows in the direction in which transportation is most needed. Because the Chinese have few good railroads and few good roads, they carry goods in boats on the Yangtze whenever they can.

See on this map the Yangtze flowing eastward through central China. At its mouth it has built up a delta with soil brought down from the western highlands. Every year this delta reaches out a little farther into the sea. This new land is very low, not much above sea level. In places the farmers have built dikes to keep the high water from flowing over their fields. Otherwise the crops would wash away when the rains come. Because the soil is fertile, millions of people live crowded together on the Yangtze delta. The delta is, of course, part of what we call the Yangtze Plain.

The Yangtze is one of the busiest rivers in the world. It is deep enough for small ocean boats to travel upstream over six hundred miles. Smaller boats can go over a thousand miles. Hundreds of junks can be seen on the river. They travel on it even where the river passes through gorges in the mountains. But they cannot travel upstream beyond the rapids. Travel through the rapids is hard and dangerous. Small junks can be tossed against rocks and broken to pieces. The swift current may upset a small boat.

During winter and spring the water



EWING GALLOWAY

Lines of coolies pull a Chinese junk through the rapids in the gorge of the Yangtze River.

in the river is lowest. During the summer rains the river rises. It may rise high enough to overflow its banks. Upstream there are no trees to hold the water on the land. Far upstream it is too dry for trees to grow. In rainier regions along the Yangtze the trees were cleared away thousands of years ago. When there are heavy rains, the water rushes down the treeless slopes into the river. Then the river rises, higher and higher.

When the river reaches the plain, some of its water drains away into canals and lakes. In this way a flood is sometimes prevented. The flood water is saved for irrigation.

One very rainy July the Yangtze rose more than fifty feet. It spread out over the farms and cities. The dikes and roads were damaged. The people lost their crops, animals, buildings, and furniture. The farmers could not plant winter crops. But this flood would have been even higher except for the canals and lakes on both sides of the river. They drained some of the water away

The Yangtze Plain. You remember that many rice farmers live in the lower Yangtze Valley south of the river. Look again at the map of the lower Yangtze Valley, page 195. Notice the many rivers, canals, and lakes.

In ancient times a canal, called the Grand Canal, was dug connecting some of these lakes. Later it was extended northward all the way to Peiping so that rice might be carried by boat to the emperor's court. The Grand Canal starts at the city of Hangchow southwest of Shanghai. It crosses the Yangtze and continues on to Peiping. Today much of the canal cannot be used. Some parts have become filled with silt. Other parts dry up during the winter months.

All through the crowded Yangtze Plain the land is used for farming. In fact two thirds of the people are farmers. They live much as do the rice farmers about whom you have read. The fields produce well because fertilizers are used. The farms are so small that they look like mere garden plots, but most of them furnish two crops each year. On some, where vegetables are grown, three crops may be raised.

In the warm summers rice and cotton are the most important crops. Wheat, beans, and barley are winter crops. Vegetables are grown near the cities. Since the people in the cities have to buy vegetables, the farmer can sell some of his crop. Thus he gets a little income.

The West River Plain. South of the Yangtze River is another important river, the West River. It too flows generally eastward to the sea. Like the Yangtze the West River has a large city on its delta. Turn to the map on page 188 and find the name of this old city.

The delta of the West River is fertile

land, of course. Since it is near the tropics, it has long summers. Its climate is almost as wet as that of the southeast coast. Even the winter months bring rain.

Near Canton many fruits are grown. Oranges, bananas, and pineapples are raised. These fruits grow only in a warm climate. Sugar cane is also raised, and there are two rice crops every year.

PRODUCING SILK

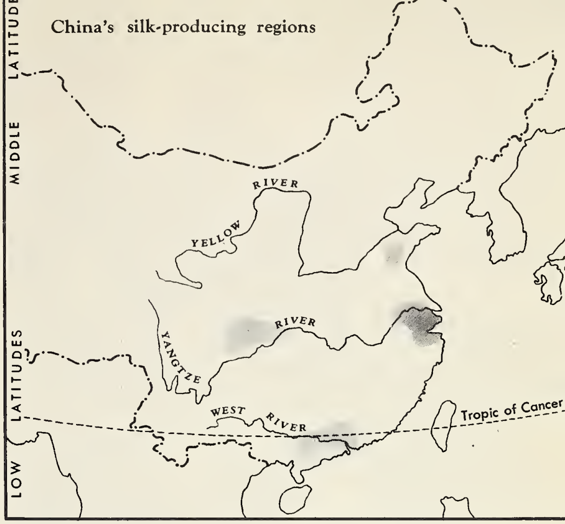
If you were visiting the plain of either the Yangtze or the West River, you would learn that much silk comes from these regions. Here is a map that shows the areas in China which produce silk. Notice that the west and the far north are not silk regions. Look at the map and see where much silk is produced. You can see that the southeast part of the country is a silk-producing region.

Silkworms. The thread used in weaving silk cloth is made from a very thin fiber, like that in a spider's web. Silk fiber comes from the body of a caterpillar called a *silkworm*.

You know that many caterpillars change into moths or even into bright-colored butterflies. The silkworm changes into a small white moth.

Life of the silkworm. Silkworms hatch from very tiny eggs, laid by the small white moths. When the eggs are hatched, the silkworms are very small. They begin to eat a certain kind of leaf and grow very fast. They eat and grow for about thirty-six days, until they are about three inches long. Four times during this period they grow a new skin and shed the old one.

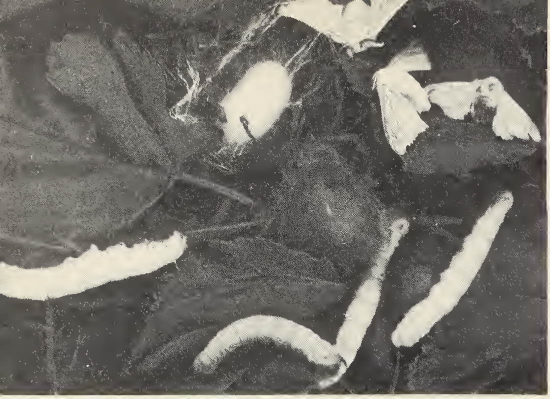
After the silkworms are full-grown, they begin to spin silk. They produce the very thin silk fiber and wind it around their bodies thousands of times. When the silkworm has finished spinning, it lies inside a thick ball of silk called a *cocoon*. We say that the silkworm has spun its cocoon.


China's silk-producing regions

If the cocoon is let alone, after about ten days the silkworm inside changes into a white silk moth. The moth cuts through the end of the cocoon and comes out, ready to fly away and lay its eggs.

Feeding silkworms. Silkworms live chiefly on the leaves of the *mulberry tree*. These trees grow best in *humid*, or moist, lands, where it is warm but not too hot. The mulberry tree is an ordinary-looking tree. It would grow quite tall if left alone. In China, however, the trunk of the tree is kept about three feet high so that it will produce slender shoots having many leaves. It really looks more like a bush than a tree. Mulberry trees are generally planted in rows. Mud is brought from the canals and small ponds and heaped high above the roots to provide fertilizer. Each tree produces from forty to two hundred pounds of leaves a year. This seems like a large amount, but young silkworms eat many, many leaves before they are ready to spin their cocoons.

Silkworms are raised by farmers.



AMERICAN MUSEUM OF NATURAL HISTORY AND METHODIST PRINTS

In the top picture are silk moths, silkworms, and a cocoon. In the lower picture a man is gathering mulberry leaves. Notice that the mulberry trees are kept low.

While the worms are growing, the farmer's entire family does the work of gathering the leaves. No one takes a holiday then. Silkworms must be fed freshly-picked leaves several times during the day and twice during the night. They stop eating only while they shed their skins and when they are ready to spin their cocoons. This steady, tiring work of feeding the silkworms is, however, only a small part of that needed to produce silk.

Unwinding the cocoons. As soon as the silkworms finish their spinning, the cocoons are placed in steam, which kills the silkworms. Then the silk fibers are carefully unwound from the cocoon by hand upon a frame which turns, called a *reel*. Chinese women and young girls do much of this work. When the reel is full, the silk, which is called *raw silk*, is removed. It is laid aside until many bunches are ready to be sent to the silk factory. There the very thin fibers are twisted or spun into thread. Some of the thread is woven into soft silk cloth. Sometimes the thread is shipped to factories in other parts of the country.

Silk can be unwound from cocoons by machinery much faster and better than by hand. Machines are used in some Chinese cities. But much winding is still done by hand in the farmers' homes.

Skillful, patient workers. Many skillful, patient people are needed to pick the mulberry leaves and feed the worms. This is slow work. Many workers are also needed to unwind the fiber of the cocoons that the worms spin around themselves. This is also very slow, careful work. Because these workers are not well paid, they are usually poor.

Silk in South China. You remember that mulberry trees grow best in a region which is warm and humid but not too hot. South China has that kind of climate. Also South China is densely settled, and many of its people will work for low pay. For these reasons China was the first country to produce raw silk. It still continues to produce silk in large quantities. Some of the finest silk yarn in the world is made near Shanghai.

However, the methods which most Chinese use in breeding and caring for silkworms and in preparing silk are not the best. Farmers often buy silkworm eggs from merchants who have obtained the eggs from other farmers. These eggs may be diseased. The silkworms may die before spinning their cocoons. Then all the work of feeding them has been wasted.

China is slow to change to modern methods, and much of its silk is not of the finest quality. Also many countries now use new kinds of cloth that take the place of silk. The cloth may even be shiny and glossy like silk. Therefore other countries no longer buy as much of China's silk as they once did. However, China still produces great quantities of silk for its own people.

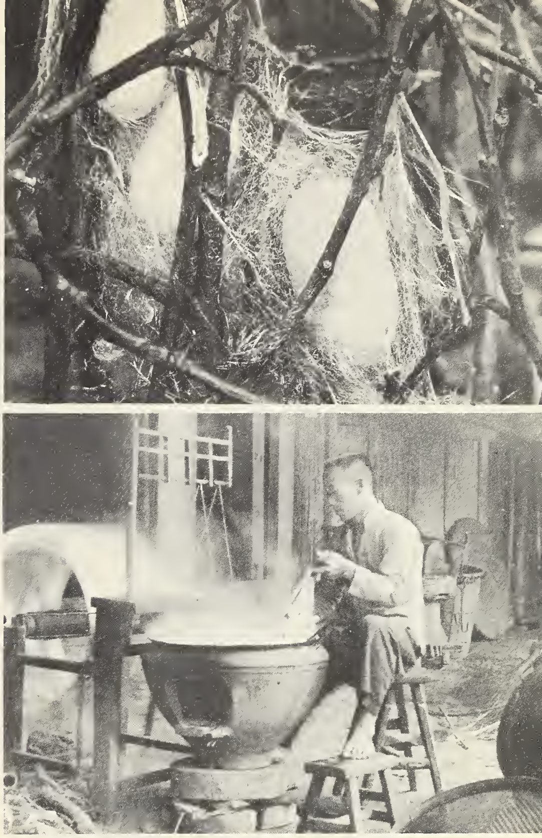
HILLY LANDS OF SOUTH CHINA

Now we shall visit the hilly country south of the Yangtze. The soil in this region is red, like that in the Red Basin. Wherever you go, red hills or mountains are always in sight. There are strips of level land only along the rivers. In many places swift streams have cut deep canyons. Look at this hilly region again on the map on page 188.

Forests. Long ago these hills were covered with forests. Many of the trees have been cut down, and in such areas rains have washed the soil away, leaving deep gullies and even bare rocks. On some slopes wild grass has covered the bare ground where trees once grew.

But there are large areas of forest where no trees have been cut down. In other parts of the region young trees have been planted on ground from which all timber had been removed. They grow fast in this rainy, warm land.

Fir trees are found here. They supply lumber for making poles and rafters in buildings. Pine trees also are plentiful. Their wood is used in building ships and houses.



AMERICAN MUSEUM OF NATURAL HISTORY AND METHODIST PRINTS

In the lower picture a man is unwinding the silk onto a large reel. With his left hand he is washing cocoons. Notice the fine silk fibers leading to the turning reel.

After the trees are cut down, most of the logs are transported to the Yangtze Valley and North China. Since many of the trees are twenty to thirty miles from the nearest river, the logs are carried that distance on men's backs. Such transportation is slow, hard work. It is therefore expensive. On the rivers the logs are floated down stream or moved by junks or modern steamships.

Where the people live. The people live chiefly in the valleys on either side of the streams. Here they have their farms on the strips of level land. The hills have almost no inhabitants. There

CNS PHOTO FROM GUILLUMETTE

A cultivated valley in the mountains of southwestern China. Some of the fields are flooded rice paddies. Some fields are used for other crops. The men in the carts are Chinese soldiers.

is little traveling from one village to another. If the crops fail on the small farms, there is danger of famine.

Bamboo. Bamboo is widely raised in this region. It is very important because in the Orient it is used in so many ways. Young bamboo sprouts are very good to eat. From bamboo are made small articles such as baskets, brooms, and pipes and large ones such as fences and ladders. Even the *scaffolding*, or framework, on which men stand when they put up buildings is made of bamboo. Rafts made of bamboo are used in shallow water to transport goods. The Chinese could hardly get along without the quickly growing bamboo.

Fine china. This part of China is famous for the porcelain made there. You remember that porcelain is a high grade of china made of fine white clay. Sets of fine dishes are usually made of porcelain. In China millions of pieces of porcelain are produced each year, mostly in small towns. Many of the articles are simple rice bowls and vases in plain shapes and colors for everyday use. Others are made in more unusual shapes and are decorated with colorful designs. They are thought so beautiful that they have been bought throughout the world. Wealthy people purchase these beautiful vases for use in their homes. Museums also display them as examples of the handwork of Chinese artists.

Tea. China has long been famous for its tea. At one time it produced all the tea that was used in the world. Almost all the tea grown in China is raised in the central and southern parts of the highlands. Tea from each valley seems to have a flavor of its own, different from the taste of tea from other valleys.

The tea plant is an evergreen tree grown in small scattered patches on dry sunny hillsides. This tree would ordinarily reach thirty feet or more in height. If the tree is pruned often, it will keep putting out new branches which bear plenty of young leaves. The young leaves are picked three times a year by members of the farmer's family.

Much of the tea is used within the country. China also supplies about a tenth of all the tea shipped to other parts of the world. This is far less than China once produced. But China's tea gardens are only small patches, while those in other countries, such as India, are large farms. The Chinese seldom prune and fertilize their trees. Often they do not even remove the weeds from around the trees. So today China does not sell much of its tea to foreign lands.

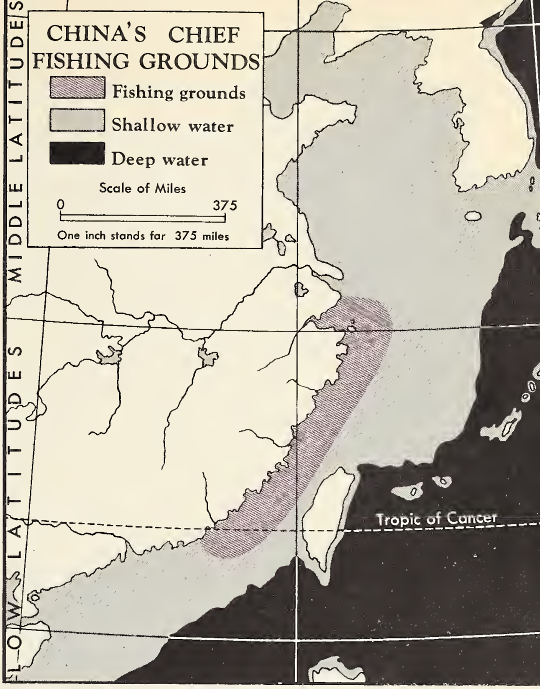
THE SOUTHEAST COAST

On the southeast coast of China many of the people are fishermen. There is plenty of timber for boats because trees grow fast in this rainy part of the country.

Where fish are found. Fish eat sea plants and other fish or sea animals smaller than themselves, and these smaller fish eat sea plants. Large numbers of fish are generally found somewhere near sea plants, and sea plants grow only in shallow water. Therefore, many more fish are found in shallow water than in deep water. What we call shallow water in the ocean would be very deep in a river or small lake. Ocean water deep enough to cover a tall building is shallow water. The seas which wash the southeast coast of China are shallow. For this reason large numbers of fish are found in these seas. This map shows the ocean areas where the Chinese catch fish.

Many fish are usually found where a large river enters the sea. Here huge quantities of fresh water containing minerals and other materials provide food for fish.

There are more and better fish in cold water than in warm water because more food for fish is found in cold water. But the fish that are caught by the fishermen of South China are those of the warmer waters.



Often the Chinese fishermen go out into the open sea to fish. Their tiny fishing boats bob up and down on the waves. As soon as the men have caught their loads of fish, they sail back to land. The fishermen want to sell their fish as soon as possible, before the fish has had a chance to spoil.

Fishing near the shore. Oysters and shrimps are gathered near the shore. Oysters are the most valuable of shellfish. They live in shallow bays where the water is less salty than in the open ocean. In these bays they find plenty of food. Young oysters grow much more quickly in warm water than in cold water. With long-handled tongs the fishermen break the thick shells from the rocks. In deeper waters the shells are torn from the rocks by dredges dragged over the sea bottom. Such a dredge is an iron frame with a strong bag fastened to it. It scoops up oysters in their shells.

Shrimps also inhabit warm water where the ocean has a muddy or soft sandy bottom. They are scooped out of the water with wire nets all during the summer and fall. Shrimps are so small and light that they can be gathered up even by hand in many kinds of small nets.

The southeast coast has many bays and protected waters, where native junks can lie at anchor. Not far inland are rugged hills and low mountains. Offshore there are numerous islands. Some are several miles long, and others are mere points of rock. The region is different from the North China coast. In North China the coastline has fewer bays, and the neighboring land is level. Along the north coast few fishing boats are seen, for there is very little wood with which to build them.

Typhoons. All through southeastern China *typhoons* bring heavy rains. A typhoon is a great whirling storm. It is a very violent whirl of air hundreds of miles across. Such storms begin near the equator. They move in a curved line, first northwest, then north, then northeast. The wind blows with a speed up to 145 miles per hour. This is several times faster than the winds we notice on a very stormy day. Sometimes the typhoons do much damage on land as well as to ships at sea.

In the eastern hemisphere typhoons usually occur from July to September. They sweep over the Philippine Islands towards the neighboring coast of China. Often before reaching China they turn to the northeast and strike Japan. Sometimes after entering China, they curve back toward Japan. When this happens, they travel twice as fast as before and strike the west coast of Japan with great force.

The Chinese have long known some of the signs telling that a typhoon is coming. Now, when they see these signs, they send out warnings to sailors at sea, for a typhoon may do great damage to ships. Men in small fishing boats watch the sky. They try to reach shore before the typhoon strikes.

Although late summer is the typhoon season, such storms may come at almost any time. China and the countries near it have about eight or nine typhoons a year. Sometimes huge waves driven by the wind sweep over the lowlands along the coast. They wash away villages and small towns. They toss ships up on land and flood the fields with salt water. The crops are ruined. If the salt water does

EWING GALLOWAY

Many fishermen in small boats fish in the rivers and canals. These fishermen are selling their catch at a wharf of a Chinese port city.

not drain off quickly, the land may not produce food crops again for several years.

Farming. Even with the food obtained by fishing, the southeast coastal region does not have enough food for its many people. Because so much of the area is hilly land, little of the land can be used for farming. Most of the level land is found on the deltas. Crops are planted on all these plains and even on some of the lower and more gentle slopes of the hills. All the land that can be cultivated is used. Crops grow well all through the year, for this is a warm, rainy region.

Wherever water can be obtained for irrigation and the soil is not too sandy, rice is the chief crop. In most areas two crops are grown each year. One is planted in April and harvested in July. The other is planted after the first harvest or in June between the rows of the first crop. Then it is harvested in October. Even so, not enough rice is produced to provide for the millions of people in this area. Large amounts have to be purchased from other countries.

Great quantities of sweet potatoes are also raised. These are grown in sandy soil and on hill slopes that are not suitable for rice. Other foods that grow here are sugar cane, tea, tobacco, *pomelos*, and tangerines. The pomelo is a kind of grapefruit. These are all warm-climate crops.

Wheat is the most important winter crop. But barley, beans, peas, and other vegetables are also grown. Crops such as mustard, *linseed*, and rapeseed are raised in the cool months. Linseed is the seed of the flax plant, from which we get linen. Linseed oil is used in paints.

A small island. Off the southeast coast of China is a small island, named Formosa, on which many Chinese farmers live. It is an island of farms, with crops much like those of South China. The main crops on Formosa are rice, sugar cane, bananas, and pineapples. Some of the pineapples are put up in cans. The farmers raise more animals than do the farmers in South China. Usually a family has several pigs and a flock of chickens, geese, and ducks. The people eat more meat than the inhabitants of China.

More than fifty years ago, Japan took Formosa from China. The Japanese used all the *surplus* foods raised on that island. Surplus food is food that is not needed in the area where it has been produced. In return Japan sent Formosa such things as fertilizers and machines. Most of the people on the island are Chinese, and now Formosa has again become a part of China.

EWING GALLOWAY

Cleaning rice on the island of Formosa. As the rice is poured from one basket to another, the wind blows away the dust and chaff.

Using Your Geography

Here are the names of two plant fibers and two animal fibers from which much of the world's clothing is made: linen, silk, wool, cotton. Write these words in two pairs, putting plant fibers together and animal fibers together.

GIVING GOOD REASONS

1. Tibet is cold because: (*a*) it is surrounded by mountains; (*b*) it is in the west; (*c*) it is very high.

2. Rivers flow from the mountains of China to the plains because: (*a*) rivers always flow from high land to low land; (*b*) the rice farmers need water to grow rice in; (*c*) it is cold in the mountains of China.

3. Deltas sometime form at the mouths of rivers because: (*a*) dikes have been built; (*b*) the river drops much of its silt there; (*c*) the ocean builds up the delta.

4. Many people live on the river plains of China because: (*a*) the rivers do not flood; (*b*) the coal mines are near the rivers; (*c*) the water from the river helps farmers to grow food.

5. Silkworms are grown in South China because: (*a*) the land in South China is hilly; (*b*) the farms in South China are near the ocean; (*c*) the climate is warm and humid.

6. China does not sell much tea to other nations because: (*a*) the Chinese need all they can grow; (*b*) the Chinese do not take enough care of their tea trees; (*c*) Chinese tea trees are too small. (See page 201.)

7. More fish are found in shallow water than in deep water because: (*a*) they like to sleep on the bottom; (*b*) it is too cold in deep water; (*c*) there are more plants to feed on in shallow water.

WORKING WITH MAPS

1. Show these areas on a map of China and tell one way in which the people of each area make their living: the Yangtze Plain, the Red Basin, Inner Mongolia, the southeastern coast, the South China highlands, and the plateau of Tibet.

2. Here is a list of place names used in this chapter. As you came to each name in your reading, you should have looked it up on the maps in this book. You may use these names to have a place-and-reason match somewhat like a spelling match. The pupil whose turn it is locates the place and tells why it is important to know about the place.

Tarim Basin
Yellow River Plain
United States
West River Plain
Gobi Desert
Yangtze Plain
South China
North China
Sinkiang
Southeastern China
Red Basin
Himalayas
China Proper
Yangtze River

Tibet
Egypt
West River
Chungking
Peiping
Canton
Japan
China
Formosa
Manchuria
Nanking
Shanghai
Grand Canal
Shantung

NORTH CHINA OR SOUTH CHINA

In which part of China would you look for the following:

a. A famous city that is really five cities
b. A farm where silkworms are grown
c. A green, wet riceland
d. A wheatland
e. Crowded cities with narrow streets
f. A farm where tea is grown
g. The Red Basin
h. Manchuria
i. A large desert
j. Oranges, bananas, and pineapples
k. Large areas covered with loess
l. A river that carries much yellow mud

FINISHING SENTENCES

Here is a list of words you know. Below are sentences with one word missing. Write the sentences and fill in the right word, using the words in the list. (*Do not write in this book.*)

mulberry leaves
scaffolding
tung oil
brine
reel
delta
rapeseed
humid
typhoon

a. An oil for cooking can be obtained from ____.
b. An oil for making paint and varnish is called ____.
c. Very salty water is called ____.
d. Silkworms eat ____.
e. If a place is moist, it is called ____.
f. A frame which turns and on which silk is wound is a ____.
g. A framework on which men stand when they build houses is a ____.
h. A great whirling storm from the ocean is a ____.
i. Level land built up by a river at its mouth is a ____.

WORDS TO EXPLAIN

raw silk
mulberry
porcelain
glacier
shrimp
oyster
gorge
cocoon
tongs

QUESTIONS TO TALK ABOUT IN CLASS

1. In what ways are the farm lands of South China different from those of North China?
2. What kinds of land in South China are used for farming?
3. Why can crops be grown throughout the year on the lowlands of the south?
4. Describe the climate of the southeast coast, telling about winds, rains, and temperatures.
5. Why is South China well suited to the production of silk?
6. Why is China no longer the leading producer of silk?
7. Name three chief crops of South China and explain how the climate is suited to raising each.

GROWING SILKWORMS

If you lived in a Chinese family that grew silkworms, what work might you have to do? Would your parents work at home or in a factory? Tell the class about the silkworm from the time it hatches until the raw silk is spun onto reels.

GOOD, RICH SOIL

Explain why the Yangtze Plain is a good place for farms. (Clues: Is the soil of flood plains good soil? Do farms need water?) Do the farmers use fertilizer? Explain how a farmer can grow two or three crops a year on one piece of land. What crops are grown on the Yangtze Plain? (Clue: Study page 196.)

EWING GALLOWAY

The harbor at Canton. Large ships cannot enter this harbor, but thousands of small boats come by river and canal with products of the West River Plain and the near-by hills.

The Port Cities of China

Trade is an important occupation in cities and an important reason for their growth. You have already learned that the ocean is a great world highway. Even a small steamer carries as much freight as an ordinary freight train. A large steamer holds several trainloads of freight. A small passenger steamer carries more passengers than a long train of sleeping cars. A large ship carries several trainloads of passengers.

PORT CITIES AND TRADE

Ocean routes. Cities where ships unload or take on cargo are called *ports*. Much of the trade of the world goes on between the great port cities on the ocean. Day and night ocean ships travel from one port to another. Because the ocean is so large, these ships could follow many different routes. Some of these routes are, of course, shorter than others

The ships usually follow the shorter routes over and over again.

Look at this map of the world. Notice the black lines crossing the ocean and joining the continents. Each line stands for an ocean trade route. Along these routes ships travel, carrying passengers and goods from one country to another. Notice that trade routes lead across the three large oceans but none go to Greenland or Antarctica. Why?

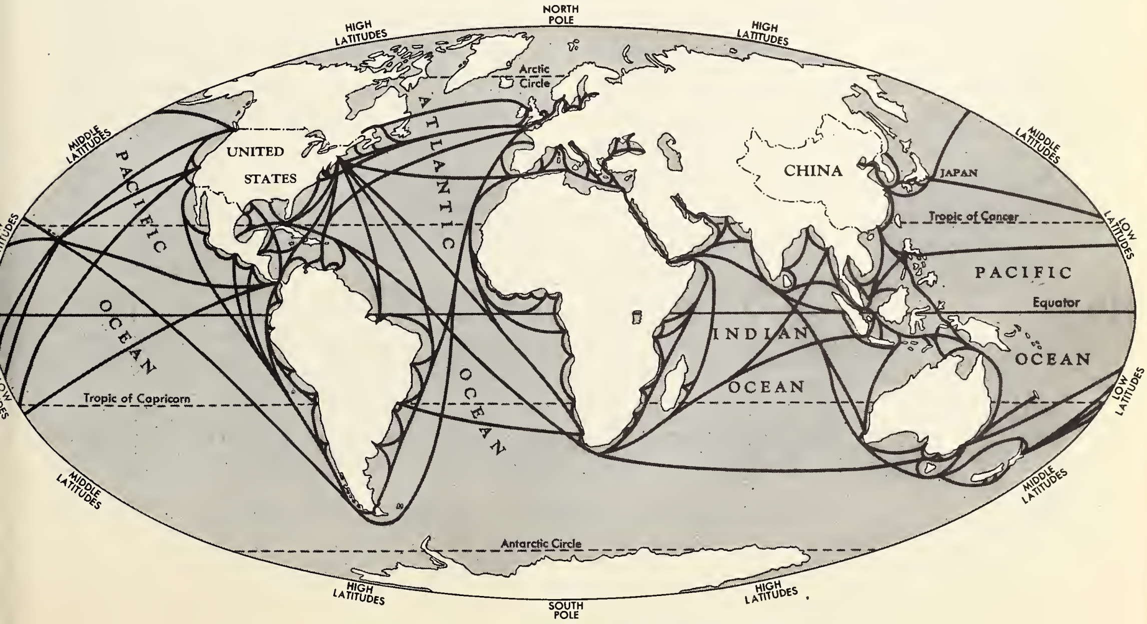
On some routes more goods are carried than on others. Find the routes reaching from the United States eastward across the northern part of the Atlantic Ocean to Europe. Many ships carry huge cargoes along these routes. They are used more than any others in the world.

Find the country of China on this map. Notice that few ocean trade routes reach China. Fewer ships follow these routes. And they must travel long distances across the wide Pacific Ocean.

Harbors. Some ports have good *harbors*. Harbors are natural waterways that offer protection to ships. Perhaps the city is inland beside a river where the water is deep enough for large ocean-going ships to land their goods at wharves. In a river a storm cannot raise waves strong enough to damage the ships. Or a city on the seacoast may have a good harbor. Its waterway may be a deep body of water protected by islands. Because these islands lie between the waterway and the high seas, they shut off violent waves during a storm. Or the harbor may be a bay that is almost surrounded by land. Remember that harbors are natural waterways. Men have not made them.

Men often deepen a harbor by dredging. In some rivers so much silt collects on the bottom that the harbor is too shallow for large ships to enter. Unless the harbor is dredged again and again it cannot be used by large ships. In some parts of the world, however, even though a river drops a great load of silt, the harbor remains open. As the tide goes out, the mud is washed out to sea.

Sometimes a city needs a good harbor but has none. Then men may build great


OCEAN TRADE ROUTES

EWING GALLOWAY, AND SCREEN TRAVELER FROM GENDREAU

On the left is a harbor on our Pacific coast. It is one of the greatest natural harbors in the world. On the right is a breakwater protecting a small port on the Mediterranean Sea.

stone or concrete walls, called *breakwaters*. The breakwaters extend out into the sea to break the force of the waves. In this way they provide a waterway where ships can anchor.

At night lighthouses with strong lights guide ships to a harbor or port. Each lighthouse flashes its light differently from near-by lighthouses so that sailors can tell them apart.

What you would see in a port. In a harbor or port platforms are built out into the water or along the shore as landing places for goods. Ships load and unload at these *wharves*. On the wharves are great *warehouses*. Warehouses are large buildings in which goods are stored. Some warehouses are just large sheds. Warehouses that are used for storing grain are usually high round buildings with round tops.

Railroad tracks run out on the wharves. Freight from the railroads can therefore be loaded easily on ships. Sometimes the freight is placed in warehouses until ships are ready to transport it. In the same way freight brought in by ships can be loaded into cars or placed in warehouses until the cars are ready.

Remember that goods sent out of a country are called *exports*. *Imports* are goods brought in from another country.

CHINA'S TRADE WITH OTHER COUNTRIES

Early traders. You have learned that for a long time the ocean to the east of China kept that country from learning about foreign lands. Visitors did not come to China by sea until after Columbus discovered America. The first people who came to China to trade were the Portuguese, from western Europe. These traders sailed around the southern end of Africa, crossed the Indian Ocean, and then passed through a strait into the South China Sea. In this way they came first to the southeast coast of China. It was natural that they should begin trading with the people living along that coast.

At first the Chinese were afraid to trade with merchants from distant lands. They feared that the traders might capture their seaports. They did not know that the traders could bring goods which China could use. They did not want people coming into their country from the outside.

In the year 1842 the Chinese decided that trade might be carried on in a few Chinese ports. The Chinese agreed to let foreigners live in these ports and do business. After that, China's trade increased year by year. Such trade carried on between countries is known as *foreign trade.* Trade within a country is called *domestic trade.*

China's exports. When ships from the United States first visited China, they brought little to sell. But they found much to buy. For a time China's foreign trade was made up largely of exports, chiefly tea and silk. Later China began also to export many more products. Besides tea and silk it sold soybeans, cotton, hides, wood, cereals, and even cloth and cigarettes. As time passed China's foreign trade became much larger.

China's imports. The Chinese learned that other countries had products which the Chinese could use, such as cotton goods. Soon China was buying more each year than it sold.

You know that China grows cotton. You may therefore wonder why it should import cotton. The cotton which is grown in China has short fibers. It is purchased by the United States for mixing with cotton having long fibers. The mixture is used in making blankets and other articles. The cotton which China imports is the long-fiber cotton. It is needed in weaving certain kinds of cloth which the Chinese use.

Most of China's imports are manufactured goods which can be sold at low prices. Of these goods *textiles*, or woven materials, are among the most important. Foods such as sugar, rice, and flour are also imported. Of course, most of the people of China are too poor to buy articles made in other countries. Thousands of wealthy Chinese, however, are able to buy expensive imports, including automobiles.

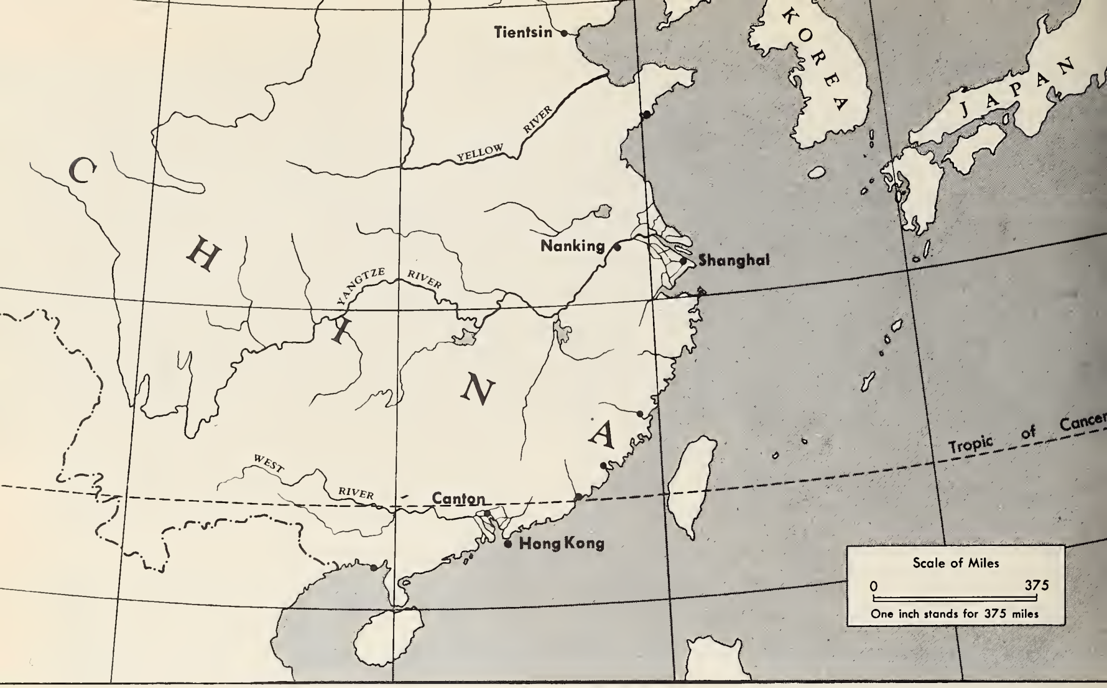
Canton. Turn to the map on page 188 and find the mouth of the West River. Now look north of the river's mouth and find the city of Canton. Canton was the very first city in China to carry on foreign trade. This city is located on a rich delta plain made by the West River and two smaller streams. It is upstream from the ocean and is built on the banks of still another small stream. Canton is almost surrounded by rivers.

You might think that Canton would have a good waterway to the sea — that large boats could reach the city. But it is not a great ocean port today. Modern ocean-going ships cannot bring cargoes to Canton, for the river is too shallow.

Yet Canton is a very important Chinese city. It is still a center of trade and is the leading shipping center for South China. Along the coast and inland along the rivers are good farming lands. As you know, these farms raise two rice crops a year, fruits, and other products. Any surplus sold outside the region passes through Canton.

Many of the people of Canton have visited foreign lands. The first Chinese people to come to the United States were from Canton. Many of them remained here as workmen and sent money back to Canton. Many returned to China with new ideas and with money to improve their city.

In some of the old sections of the city you can still see narrow streets. But in other parts wide streets have been built. Today miles of paved roads lead out of Canton. This old city is using



the new ideas that its people have brought from foreign lands. This is one of the reasons why it is growing very fast.

This map shows the port cities of China. Find Canton. Find the West River.

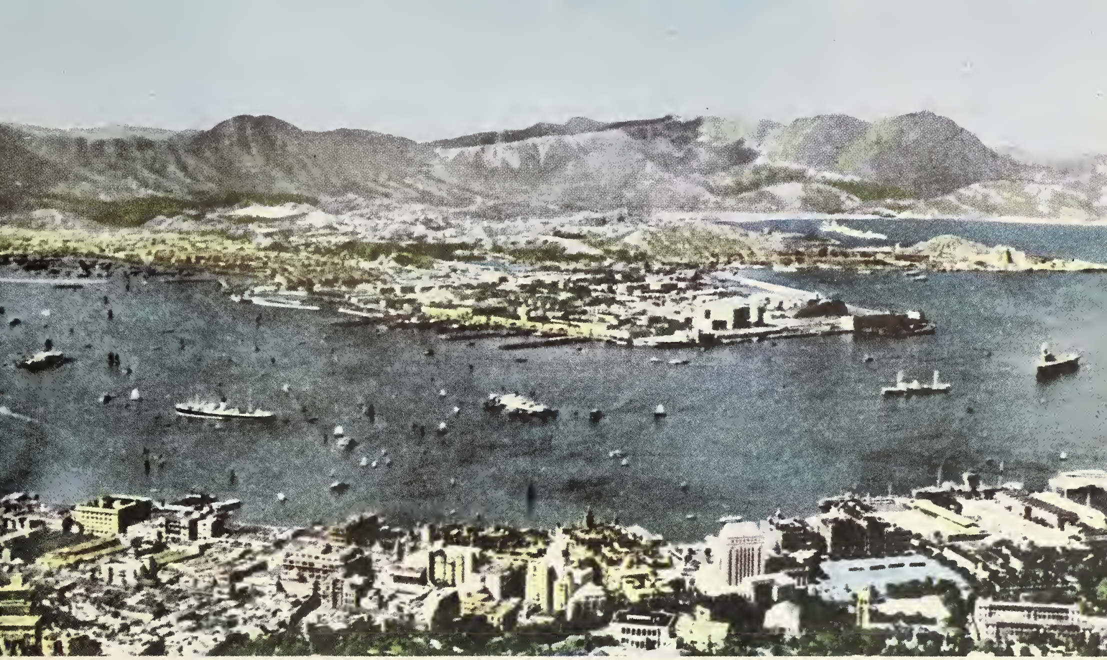
Canton is a good center for domestic trade. Small boats, such as you might see on Chinese rivers, can reach the city. But Canton cannot ship goods directly to foreign countries. It has to use another port. Next you will read about the island to which Canton ships its goods so that they can be sent to distant lands.

Hong Kong. Off the coast southeast of Canton is the island of Hong Kong. Find this small island on the map. It used to be barren rock. Then about a hundred years ago the British sent people to live there. We say the British made a *colony* on the island. The British are people who live in Great Britain, a group of islands just west of Europe. Find Great Britain on your globe.

The British are a trading people. They have built many colonies in different parts of the world. Some of these have become countries that rule themselves. But they carry on much trade with Great Britain. Hong Kong is only a small British colony, but it is a very valuable one. The island is close to the main shipping routes to Europe and to America.

In the northwest corner of Hong Kong the British built a modern city, Victoria. This city is often called Hong Kong, the name of the island. It has become one of the leading ports of the Orient. With its modern buildings and wide streets it is not at all like a Chinese city. Since the island is really a mountain peak rising out of the water, Victoria is a city of terraces and hillsides.

Hong Kong has an excellent harbor. Along the shore are many long wharves where ships land their goods and take on supplies and new cargoes. Machines are



PHILIP GENDREAU, N. Y.

Hong Kong harbor, seen from a hill on the island of Hong Kong. At the bottom of the picture is the modern city of Victoria. Across the harbor is a peninsula on the mainland of China.

used for moving heavy loads on and off ships. There are many large warehouses where goods can be stored.

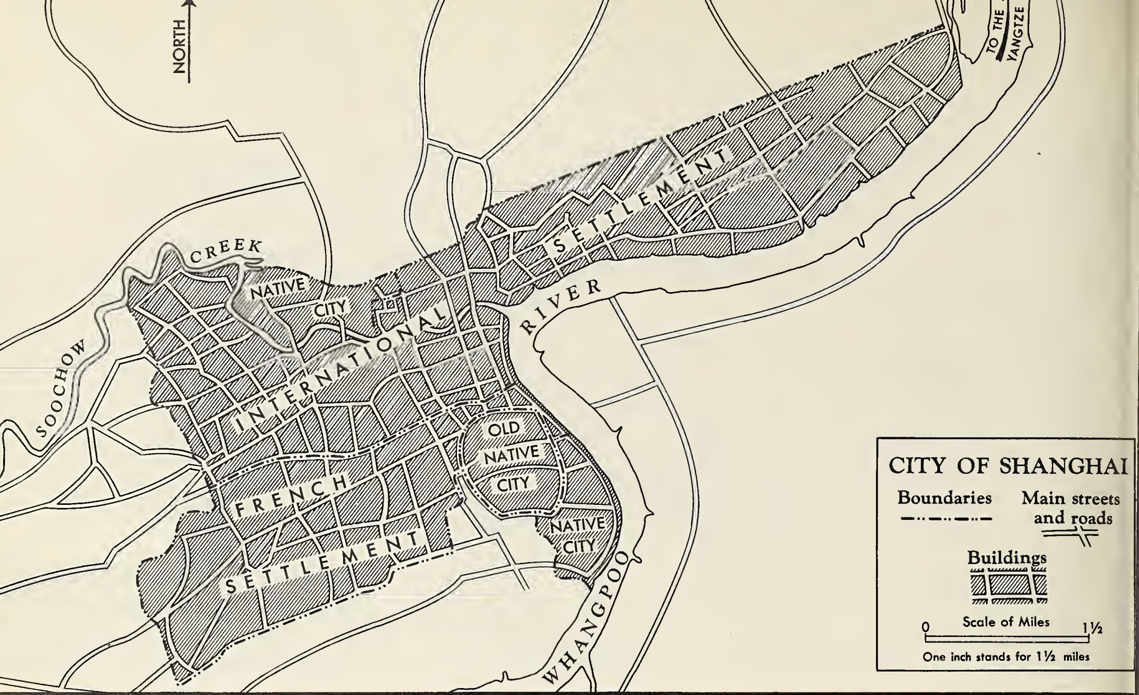
Large ocean vessels from foreign lands leave goods at Hong Kong. Here the imports are divided. Some are used in Hong Kong, but many are sent to smaller ports in China, especially to Canton. These smaller ports do not have large enough harbors for ocean-going steamers.

Many Chinese junks can be seen in the harbor. They come on the canals and rivers from farms in South China bringing small cargoes of fruit, vegetables, hogs, and ducks. Fishing junks return from the open sea to bring their catch to market. Houseboats too can be seen. Many natives live in such boats all their lives.

A commercial port. The important point to remember about Hong Kong is that the island is a commercial port, trading with foreign countries. It is but a short distance from smaller ports on the South China coast. From these small ports it obtains goods to sell, and it sends to these ports many things brought in from distant lands.

If there were no near-by cities from which Hong Kong could get goods for export, it could not be a trading port. Hong Kong itself is not a large producer of goods. Most of its materials come from other areas. Nor can its people buy all the goods brought to it. Most of the people of Hong Kong live by doing the work of shipping goods. They do not fish, herd, or farm the land.

Hong Kong may not continue to have the great amount of foreign trade which it has enjoyed. Canton can handle enough exports and imports to pay even the largest ocean steamers to stop there.



Perhaps some day it will improve its harbor by dredging the river. If Canton becomes an important seaport, it will take much of the ocean trade that now goes through Hong Kong.

Shanghai. China's greatest port is Shanghai. You remember that Shanghai is located close to the sea not far south of the Yangtze River. A little more than a hundred years ago Shanghai was just a small fishing village. But it did not remain small after China's ports were opened to foreign trade. Within two years Shanghai was handling a fifth of China's imports and exports. Today nearly half of China's foreign trade passes through Shanghai. It is an important world port.

Remember that in reading about a city you should find out the reasons why people live there. There is usually more than one reason. Shanghai has not grown large for the same reasons that Peiping has. Shanghai has the only good harbor near the mouth of China's greatest river. Its location makes it a natural seaport for shipping the products of the Yangtze Valley. Being halfway along the coast between the north and south, Shanghai receives goods from a large area and ships them to foreign nations. There are two great steamship routes crossing the western Pacific. One goes to North America, the other to Europe. Shanghai is on both these routes.

Inside Shanghai. Shanghai is made up of three parts. You can see them on this map. It has an International Settlement where most of the city's trade is carried on. *International* means shared by two or more nations. In the International Settlement many of the inhabitants are foreigners. A second part is the French Settlement, which is made up largely of homes. The third part is the Native City. This includes an Old Native City which once had a wall around it. Though most of the population is Chinese, thousands of foreigners live in Shanghai.

The Bund, which is the chief business street, is also the *water front*. A water front is the part of a city which faces a body of water. All along the Bund are modern buildings such as banks, hotels, clubs, and office buildings. The Bund looks much like an important street in a large city in the United States. At one end is a public garden. From this garden one can often see great ocean liners, river steamers, junks, and *sampans*, which are small river boats. On these sampans many Chinese are born and live their entire lives.

Besides being a great seaport, Shanghai is a manufacturing city. Many useful articles are made there. The necessary materials can reach the factories easily. The finished articles can be shipped by water to many parts of China and to other lands.

ABOUT MANUFACTURING

What is an industrial country? Before you can learn about the factories in Shanghai and the other Chinese port cities, you will need to know a little about manufacturing the world over. In some countries there are many people who work in factories. Many of the products of these countries are manufactured products. We say that these are *industrial* countries, for *industry* is another name for work. It means especially the kind of work men and women do when they manufacture useful articles.

Thousands and thousands of kinds of useful things are made in industrial countries. Hundreds of these things you use every day, such as clocks, shoes, soap, coats, and spoons. Manufactured articles are made from materials which may have come from almost any country in the world.

Some countries or parts of countries in the world are industrial. Others are not. The people of China, you know, are mostly farmers. It is not yet an industrial country. In only a few of the larger cities is manufacturing important.

Where factories are found. If you wanted to build a factory, you would have to decide where you would build. You would have to think about four things — where you will obtain the materials to make into factory products, where you are going to sell the products you make, where you can hire workers for your

A view of the Bund in Shanghai. Fine modern buildings overlook the crowded harbor.

EWING GALLOWAY

In the harbor at Shanghai are many boats, bringing food and other products to the city.

EWING GALLOWAY

factory, and where you can get power to run your machines.

Materials. You cannot produce anything in a factory without materials of some kind. Many factories use materials just as they come from the earth or from plants or animals. These materials are called *raw materials.* Wool as it is cut from a sheep is a raw material. Woolen cloth, however, is not a raw material because men have worked on the wool. They have made it into yarn and woven it into cloth.

A factory must be built either where there are materials or where materials can be brought. You cannot have a steel mill without iron ore. You cannot have an automobile factory without steel.

Markets. After a factory makes useful things, it has to sell them. So, you could very well locate your factory near *market* areas where people will buy your products. Or perhaps your products can be shipped easily and cheaply to places where people need them and have the money to buy them. Then you could locate your factory at a great distance from your markets.

Labor. Large modern factories hire thousands of workers to run the machines. Workers need homes, fuel and electricity, food and clothing. It is usually expensive to bring workers to factories and to build new homes for workers in new towns near the factories. It is much cheaper, if possible, to build your factory in an area where the kinds of workers that you need are already living.

In some factories the workers need to have little skill. Other factories must have skilled workers. Factories where cloth is made need skilled labor. They are often located in large cities, where there are plenty of workers. These cities are often far from where the raw materials are produced.

Power. While you are thinking about materials, markets, and labor, you must also think of power. In modern industry men do not work with their hands alone. You will need power to run the machines in your factory. Often electricity is the power used. Or power may come from fuel which is burned to make steam. You know that steam engines are used to drive machinery. The most important kinds of fuel are coal and oil. Oil is made from *petroleum*, a valuable mineral which is a liquid. You must build your factory where you can get electricity or fuel for power.

Cost of transportation. You might find many places where you could get power and labor for your factory. When you choose between these places you must make sure that you will have good means of transportation. Quick, cheap transportation is needed to bring raw materials to your factory. It is also needed to take your factory products to your market.

Some factories are located near to the farms or mines or forests where the raw materials are obtained. Steel mills, which make steel from iron ore, are built at places to which coal and iron ore can be brought cheaply. Mills that use steel to make large and heavy products, like automobiles and airplane engines, must be located near the markets. It is less expensive to ship the steel from the steel mills to the factory than to ship these heavy products long distances to a market.

Some factories, which make small products like watches, can be located in any place where there are power and skilled workers. In such factories the cost of shipping both materials and finished

H. ARMSTRONG ROBERTS AND EWING GALLOWAY

Heavy and light industry. The first picture shows a steel mill in the United States. In the second picture, expert Chinese workmen make beautiful rugs in a factory in Peiping.

products is small, and the cost of labor is high. But usually transportation costs are very important in locating factories.

What you might see in an industrial city. Many kinds of manufacturing may be carried on in an industrial city. In some cities minerals from the earth are turned into pure metals by means of fire. In such cities there are sure to be large buildings and chimneys and steel cranes. You can see all these as you drive around the city. The cranes are used for lifting heavy loads. They lift raw materials and finished products such as great slabs of metal. In such cities you would also see great piles of coal or iron ore or other minerals. A single manufacturing plant may be almost a city in itself. Perhaps you have seen an industrial city which has such factories, or perhaps you live in one. But China has few large factories of this kind.

There is another kind of manufacturing, like the making of cloth, in which plant or animal products are used. Here the finished articles produced are not heavy, as farm machines are. Less use is made of fire. Such a factory may be one large building or a group of buildings. But near it you would see no piles of iron ore or other minerals, no heavy cranes, and few tall chimneys.

There is still another kind of factory where a large amount of skillful and careful work is done to a small amount of metal or other material. You have just read about watch factories. But China also has factories of this kind making things like lace, embroidery, and cheap jewelry. All the material used in these factories may be imported from other countries.

Most of the factories found in Shanghai are of these last two kinds.

BEGINNING OF INDUSTRY IN CHINA

You have learned that China is a land of villages and farms rather than of cities. Many of the articles produced there are made by hand. Spinning and weaving are still done chiefly in homes. Most of the cloth made is woven on hand looms by village weavers. Farm tools also are usually made at home by the family.

But China has begun to build factories in some of its cities. These factories use electricity or steam to run machines.

Manufacturing in the port cities. Sometimes raw materials are moved to a certain port from near by so that work can be done to them before they are shipped to foreign lands. For example, juice from sugar cane is usually made into raw sugar before being shipped. In some port cities raw materials are made into manufactured articles. Factories are often built in seacoast cities such as Shanghai.

Where manufacturing and trade go on, there must be buildings of different kinds. Workmen are needed to put them up. So trade provides markets. Markets usually bring factories. Factories need buildings. Factories and buildings need workmen. Workmen need houses to live in. They need food and clothing. These are sold in stores. Stores usually handle some of the goods that made the trade that made the city.

In the port cities of China there are steel plants, cotton mills, flour mills, paint factories, and other manufacturing plants.

In Shanghai some factories make fibers into thread, while others weave cloth. There are also several *shipyards*.

A place where ships are built is called a shipyard. A ship is not built out of raw materials but of materials that have already been manufactured, such as engines and slabs of steel. The modern ship is the biggest movable thing that men can build. It usually takes more than a year to build a very large ship. The shipbuilding is done out of doors or under huge sheds. There must be navigable waters so that the finished vessel can be floated away as soon as its *hull* is completed. The hull is the body or frame of the ship.

Most of China's factories were small to begin with. In the past most businesses in China have been owned by a single family. Even today Chinese factories are not so large as American factories of the same kind. But modern Chinese factories are large enough to be owned by several Chinese friends or friendly families.

Raw materials for manufacturing. As you have read about China, perhaps you have noticed that it does not have great supplies of minerals for manufacturing.

There is enough coal in China to provide for the people's needs for several hundred years. Even then the supplies might not be used up. Only three nations in the world have more coal than China. Almost every Chinese province has some coal. But most of the mines are far away from water transportation and from the densely settled plains.

There are masses, or *deposits*, of minerals in the earth that have not yet been found. But China is not a great mining country today. It has little oil and few large deposits of iron ore. What ore it has is located far distant from the coal needed in making iron. The ore is also hard to mine. China cannot make great quantities of iron and steel as the United States does.

There are other minerals, too, of which China has less than it needs. Its wealth is not in minerals that are used in manufacturing.

Workers for factories. China has plenty of workmen to do the kinds of work that have to be done in factories. Its population is large and is growing rapidly.

But the Chinese are not used to working in large factories. For hundreds of years they have worked as family groups or small groups of farmers in the villages. They have usually worked with friends or relatives, not with strangers. They have made tools and other articles for people they know. Workers in a factory do not know the people who will use the things they make. But the Chinese are good workmen. They are slowly learning how to be good manufacturers.

There are times during the year when Chinese farmers cannot be spared from the farms for factory work. They have to plant, cultivate, or harvest the crops. Men who have studied ways of living and working in China tell us that small factories should be built in the farm villages. They say that such factories would be easier for the workmen to reach than large factories in the cities. In village factories a man might work for only part of the time. He could return to the farm when he is needed. Many Chinese farmers could work in factories when there is no farm work to be done.

Markets for factory products. A factory must be able to sell the articles it makes. Otherwise it cannot buy new material and pay its workmen. China Proper has plenty of people. They use huge quantities of cotton cloth, cigarettes, and tools. But they use only a few of many other products made in factories. They use very few of the machine-made products that farmers in the United States need to have. Most Chinese farmers get along without farm machines. They do not have washing machines in their homes. Think for a minute of the manufactured articles in your home. Would you expect to see many such articles in the village home of a Chinese family?

There are two main reasons why the Chinese use few manufactured articles. (1) Many products are new to the world, and the Chinese are slow to change their ways of living. (2) The farmers and their families must use all their time and labor in getting just the necessities of life. They have few surplus crops to sell. Thus they have no money with which to buy manufactured goods.

EWING GALLOWAY

This Chinese ivory carver with skill and care makes costly things from raw material.

Manufacturing and income. China's big problem is that there are too many people for the land. Its farmers cannot make a good living on their land. Therefore other work of some kind is needed. More factories would provide income for many poor families of China. When people work at manufacturing, they make many products in a short time. The sale of these products brings income to the factory owners and to the workers. The farmers of China could earn more money if they could work in small factories when there is no work to be done on their farms. Many people think that China can provide a good living for its people only by becoming an industrial country.

Learning and Doing

If you wanted to build a factory in China, in which of the following places would you build? You may decide on more than one, but be sure to give reasons.

Loessland
Shanghai
Hong Kong
The Gobi Desert
Canton
Peiping

REVIEWING WHAT YOU HAVE LEARNED

1. In what parts of a country are factories most likely to be found?
2. Review what you know about the factories in China today. Tell about their size, what makes the machinery go, what raw materials are used, where these materials come from, what is done to them, and how the finished articles are sent away.
3. What would you see in Hong Kong that suggests modern life? What else might you see there that suggests older ways of living?
4. How can an island such as Hong Kong carry on world trade?
5. Is China an industrial country? Give reasons for your answer.
6. Why do the masses of people in China use few manufactured products today?
7. Why are better means of transportation one of the great needs in China today?

ARE YOU A GOOD DETECTIVE?

You should be able to find answers to the following questions if you study the picture on page 206.

1. Do people live in the boats shown at the bottom of the picture?
2. In what ways is Canton a modern city?
3. Is there any high land near Canton?
4. Does Canton have any manufacturing? (Clue: What would smokestacks mean?)
5. Are all boats that come to Canton run by engines?
6. Is the river at Canton a busy place?
7. Is the sun hot at Canton? (Clue: Where do you like to sit on hot days?)

WRITING WHAT YOU HAVE LEARNED

1. Make a list of ten common things that you use or see every day which were made in factories. After each article name at least one of the raw materials used to produce it. Here is a sample:

Useful Article	*Raw Material*
Coat	Wool
Breakfast food	Wheat
Spoon	Silver

2. The following list has words about trade, manufacturing, and minerals. Other words are *miscellaneous*, that is, not all of the same kind. On your paper write these four headings: Minerals, Manufacturing, Trade, Miscellaneous. Copy each word under the right heading, and after each word give a short statement explaining what it means. When you write down the headings, be sure to leave enough space for what you will say about the word.

foreign trade
petroleum
breakwater
domestic trade
raw materials
water front
warehouse
port
harbor
textile
colony
wharves
exports
sampan
industrial
imports
factory
freight
shipyard
hull
income

WORKING WITH MAPS

1. On your small outline map of the world show the route followed by the Portuguese when they first came to China to trade. What has happened since that time which makes it possible for men to take a shorter sea route today? Draw this route also on your map, using a dotted line or another color. Make a key for your map. The meaning of a key is given on page 36.

2. Show why Canton was the first port in China with which Americans traded.

3. Using a map explain why the location of Shanghai has helped to make it a great trading center.

4. Why is Hong Kong called an island? What advantages for trade does it have that Canton does not have?

5. Point to each Chinese city which you have read about and tell one reason why it is important. Altogether you ought to name five cities.

GIVING REASONS IN YOUR OWN WORDS

(Do not write in this book.)

1. Hong Kong has become an important port because --------------------.

2. Even though large foreign ships do not stop at Canton, the city is important because ----------------------------.

3. Very big cities are often found at the mouths of rivers because -----------.

4. An industrial country needs power, such as electricity and steam, because ------------------------------------.

5. Factories are sometimes built close to raw materials because --------------.

6. Chinese factories are often small because -----------------------------.

7. The Chinese use few manufactured articles because ----------------------.

8. Even though China raises cotton, it also imports cotton because ---------.

GIVING GOOD REASONS

1. Harbors are necessary because: (*a*) they always have wharves; (*b*) they protect ships from waves and storms; (*c*) they make seaports more beautiful.

2. Railroad tracks run onto wharves so that: (*a*) people will not have to walk to the ship; (*b*) freight can be loaded; (*c*) the ship can get closer to land.

3. Hong Kong is a more important shipping center than Canton because: (*a*) it has a much better harbor; (*b*) Canton cannot get Chinese goods; (*c*) the British are a trading people.

4. Shanghai is China's greatest port partly because: (*a*) railroads come into the city; (*b*) it has an important International Settlement; (*c*) it has a fine harbor at the mouth of the Yangtze.

5. Chinese factories are often not modern because there are not enough: (*a*) workers; (*b*) owners; (*c*) machines.

6. More manufacturing would help China because it would provide more: (*a*) tung oil; (*b*) income; (*c*) food.

CAN YOU JUDGE DISTANCES?

Study the map on page 210 and answer the following questions:

1. Could you get from Shanghai to Nanking in one day by train? From Hong Kong to Tientsin?

2. If a ship can do 200 miles a day, about how many days would you spend on a boat trip from Hong Kong to Shanghai?

3. Is Shanghai closer to Japan or to Canton?

4. Name two Chinese cities south of the Tropic of Cancer.

5. How is the Yellow River different from the Yangtze and the West Rivers?

EWING GALLOWAY

A famous Japanese volcano, Mount Fuji. The Japanese workers are harvesting tea leaves.

The Country of Japan

Japan is an island country east of China. The Sea of Japan lies between these two countries. Notice on the map on page 152 that Japan is made up of four main islands and many smaller ones. The largest of all the islands is Honshu. North of Honshu is Hokkaido. To the west and south are Shikoku and Kyushu. These four islands are separated from one another by narrow straits. Together with many small neighboring islands they are called Japan Proper.

For thousands of years these Pacific islands have been the home of the Japanese. The Japanese are chiefly a Mongolian people. As a race, they are short in height. They have dark eyes and tan skin. Their hair is black and usually straight.

Like China, Japan is a very crowded country. This small country has more than half as many people as the United States.

HOW THE JAPANESE ISLANDS WERE MADE

Mountains beneath the sea. The islands of Japan are the tops of mountains which rise from the ocean floor. Many thousands of years ago they were slowly lifted up above the surface of the sea like huge blocks of ice piled up on the edge of a lake in winter. Each time a mountaintop moved upward, the islands were probably shaken by an earthquake.

Not far from the eastern side of Japan the ocean is very, very deep. In fact, this is one of the deepest places in the ocean. On the eastern shore of Japan steep mountains rise almost straight up from this deep ocean bottom. Their tops reach into the air from very far below the surface of the ocean. Of course, these mountains have not remained as they were when they were lifted above the sea. They have been greatly changed by running water and earthquakes.

On the west the mountains of Japan are joined to the continent of Asia below the surface of the sea. The Sea of Japan is shallow. The East China Sea is not so deep as most seas.

Earthquakes today. Even today the islands of Japan are being raised and lowered. In 1923 there was a terrible earthquake centering in the ocean just southeast of Tokyo, the capital city of Japan. This was one of the worst earthquakes in modern times. Nearly half of Tokyo and its great seaport, Yokohama, were destroyed by this earthquake and the great fire that followed it. Many other cities were badly damaged. The southeastern shores of Japan trembled, and many buildings were shaken down. Large numbers of people were crushed by the falling houses or were burned to death in the fire. Millions lost their homes.

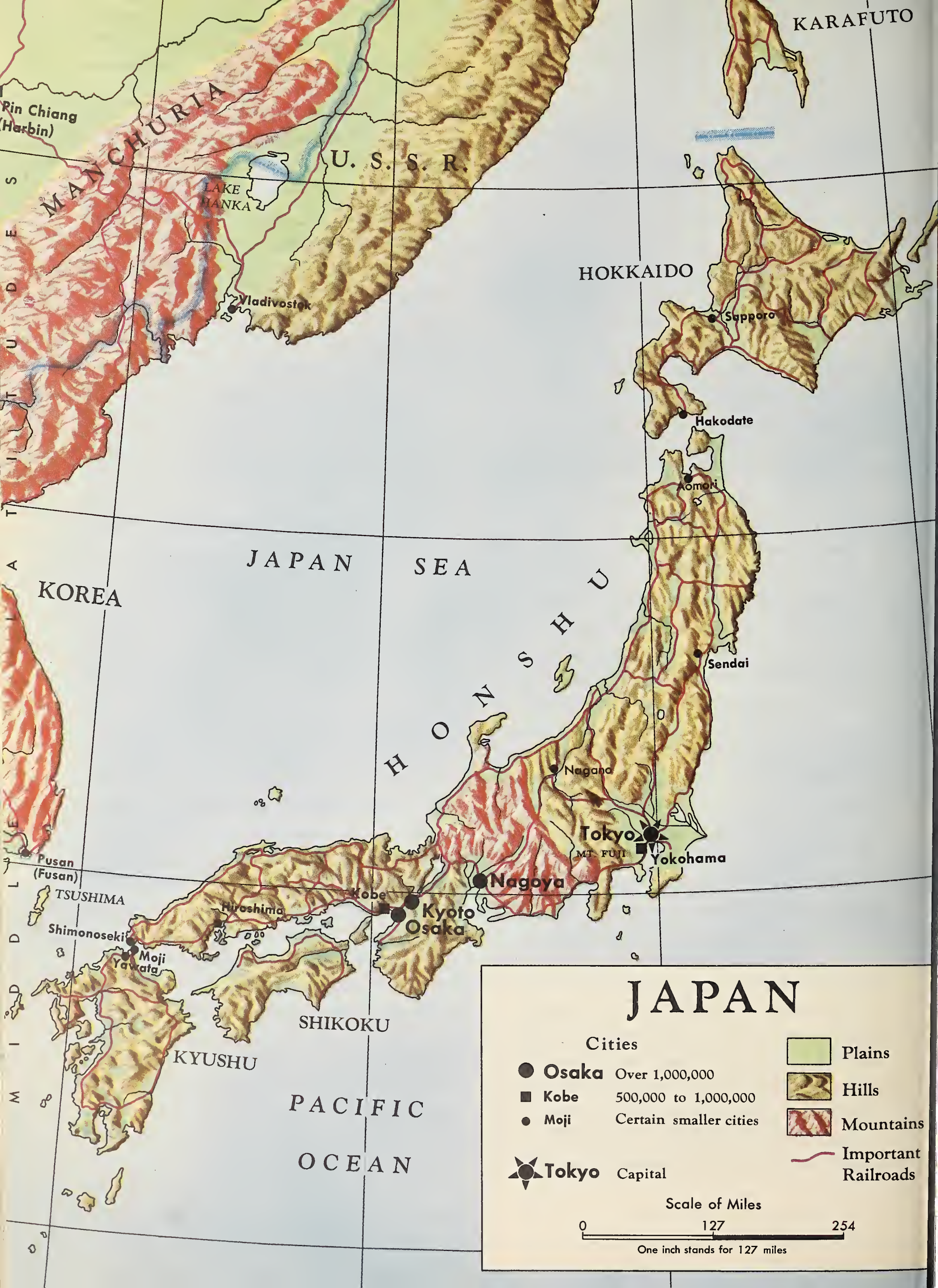
The Japanese immediately began to rebuild their cities. A few years afterward Tokyo and Yokohama were nearly as big as ever. When the business sections of the cities were built again, concrete and steel were used in the large buildings, to make them safe from earthquakes.

Again in 1946 there was a terrible earthquake in the ocean bottom less than a hundred miles from Shikoku. A wave of water ten feet high swept over the villages and cities along the shores of Shikoku and southern Honshu. Hundreds of people were washed away. Many villages were crushed to pieces or swept out to sea. Junks and fishing vessels were sunk. Some boats were swept inland and left far above the level of the sea. Japanese families fled into the highlands. They were afraid to stay on the coast where there might be huge waves.

Sometimes the trembling of the earth causes *landslides* in Japan. Part of the land falls or slips down a steep slope into a valley. The side of a hill or mountain may slip down, taking with it all the vegetation. Then only bare rock is left on that part of the mountainside. Many earthquakes are caused by rock slides on steep slopes of the mountains below the surface of the sea. Japan has about four mild earthquakes every day.

Volcanoes. A *volcano* is a hole in the earth through which *lava*, or melted rock, comes out from under the ground. Volcanoes often begin on level land, but they soon build up mountains of lava around the hole in the earth. Thus most volcanoes are at the tops of mountains. Some of these mountains have a fiery lake of lava at their tops. We say that these volcanoes are *active*. At times an active volcano throws out hot rock, ashes, steam, and lava from its tops or sides. Then we say that the volcano is *erupting*.

In some parts of Japan there are many volcanoes, but not all of them are active. In other parts there are almost none. Some of Japan's earthquakes come from volcanoes erupting in the depths of the ocean near the coast. And many of the islands in the Pacific Ocean have been built by volcanoes.


KARAFUTO
Pin Chiang
(Harbin)
MANCHURIA
U. S. S. R.
LAKE
HANKA
Vladivostok
HOKKAIDO
Sapporo
Hakodate
Aomori
MIDDLE LATITUDES
JAPAN SEA
KOREA
HONSHU
Sendai
Nagano
Tokyo
MT. FUJI
Yokohama
Nagoya
Kobe
Kyoto
Osaka
Hiroshima
Pusan
(Fusan)
TSUSHIMA
Shimonoseki
Moji
Yawata
SHIKOKU
KYUSHU
PACIFIC
OCEAN
JAPAN
Cities
● Osaka Over 1,000,000
■ Kobe 500,000 to 1,000,000
● Moji Certain smaller cities
Tokyo Capital
Plains
Hills
Mountains
Important
Railroads
Scale of Miles
0
127
254
One inch stands for 127 miles

Seeing Japan with the Map

Look at this map often as you read this part of the chapter. You must see on the map each thing which you read about. The main islands of Japan cover a smaller area than California in the United States. Japan is really a small country. See how the islands form a narrow band of land. If there were good roads, an automobile could travel across any one of these islands in a half day or less. An airplane can fly across in thirty minutes.

Finding latitudes. In what latitudes does Japan lie? It is not in the high latitudes as are the polar regions. It is not in the low latitudes on either side of the equator. Is Japan in the higher or the lower middle latitudes? What other country have you studied about that lies mostly in the middle latitudes of the northern hemisphere?

Notice that Japan extends from northeast to southwest. Kyushu reaches far southward almost to the low latitudes.

Learning about climate and growing season. From what you know about latitude and climate you should now be able to answer these questions about Japan. Which of the four main islands has the longest winters? Which two islands are likely to have the longest growing season for crops? What plain in China lies in about the same latitude as southern Japan? That plain is not shown on this map, but you can see it on the map on page 188. What part of China lies in about the same latitude as northern Japan? In which part of Japan would you expect to find that two crops of rice can be grown each year?

In the far southern part of Japan there are about eight months of the year when there are no frosts. This is a long growing season. In central and eastern Hokkaido, the growing season is only about half as long. In northern Japan early autumn frosts often damage the rice crop.

Following the coast line. If you lived in the middle of Honshu, would you be living near or far from the sea? How do you suppose many of the Japanese living near the sea make their living? If you started at the southern tip of Kyushu and traveled along the Pacific coast of Japan to the northern tip of Hokkaido, then back along the coast of the Sea of Japan and the East China Sea to where you started, you would have traveled many hundreds of miles. Indeed, the coast of Japan Proper is about three times as long as are the two coasts of the United States together. No Japanese family has to go far to reach the sea.

Look again at the coast line. It is not smooth and regular but is broken by bays and long peninsulas. Find a bay. Now find a peninsula. The peninsulas look like fingers of land reaching out into the sea. Which side of Japan is called the Pacific side? This side is more broken up with bays than the other.

Seeing the surface of the land. What does red mean on this map? Brown? Yellow? Green?

From this map you can see that much of Japan is rough hill and mountain land. There are many steep slopes that cannot be used for farms. Notice that on parts of the coast the hills reach the sea.

See the narrow strips of plain lying between the sea and the highlands. Many of the farm lands of Japan are on these plains. They are lowlands, separated from one another by hills and mountains. Also there are farm lands on the lower slopes and in the valleys.

Nearly all the farming areas of Japan are narrow ribbons of land divided into many tiny fields. What other country has farms like these? The farming lands in Japan are crowded with people just as they are in China.

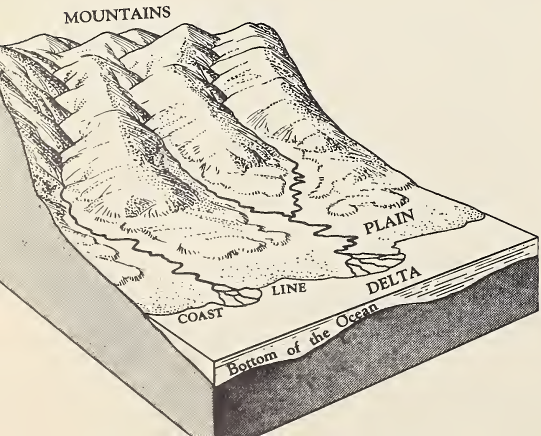
The Japanese plains are all quite small. Find the largest plain of all on the Pacific side of Honshu. It is named the Kwanto Plain. More than a fifth of all the Japanese live here. Two of Japan's six largest cities are here, including the nation's capital. Name the capital city. Name a large port near the capital. There are other smaller cities not shown on this map.

RIVERS AND PLAINS

You have now learned that Japan is a hilly and mountainous land with many small plains. You know that it is always being changed by earthquakes and volcanoes. Let us learn next about its rivers.

Look at the map on page 222. Count the rivers which you see. Would you say that there are many or few rivers in Japan? Are these rivers long like the Yangtze River in China, or are they short rivers? Since the islands are narrow, the rivers do not have a long way to go before reaching the sea.

This drawing shows you how rivers cut away mountains and build up plains and deltas.



The rivers rise in the highlands and flow toward the sea. Notice on page 222 that most rivers flow out of the hilly lands onto a plain as they near the seacoast. Almost every plain has at least one river.

On the map find a river that flows from its source in the highlands generally southward to the sea. Find one that flows generally northward. Find a westward-flowing river and an eastward-flowing one. The rivers of Japan flow in many different directions.

How rivers are formed. How do you suppose there came to be rivers in Japan? When rain falls on the sides of the mountains, some of it sinks into the ground, but most of it runs off downhill. The running water forms little streams which join into bigger streams or rivers. The running water carries along with it any loose sand or gravel, or even large rocks, that it finds in its way. It cuts a gully in the side of the mountain. As the river continues to run downhill through this gully, it cuts down deeper and deeper. After many, many years it forms a deep valley shaped like a V. You can see three of these valleys in this picture.

How river plains are formed. Nothing can stop the river from cutting its valley deeper and deeper until it is almost at sea level. That is, until it is almost at the level of the ocean into which it flows.

When the stream bed has reached sea level, the river drops much of its load of sand and gravel and mud. The channel becomes shallower. The stream widens out and cuts away the sides of its valley. The valley becomes wider and wider. Near the sea it becomes a broad plain. The river winds back and forth across this plain.

Where rivers enter the sea, they often form deltas. In Japan, where the rivers are small, the deltas are not so large as at the mouths of large rivers such as the Nile. From an airplane the Japanese deltas look like open fans. Deltas are built where the river drops its load of silt or sand when it enters still water. As the rivers cut down their V-shaped valleys in the mountains, the deltas at the river mouths grow larger and larger. In the picture you can see how the rivers have cut valleys and built up deltas.

The three largest and most important plains lie on the Pacific side of southwestern Honshu. The largest plain of all, you remember, is the Kwanto Plain. Find it again on the map on page 222.

THE FOREST LANDS

More than half of all Japan is covered with forests, and many Japanese people make their living from the forest. In the hilly and mountainous regions there are many small farmhouses built of wood with roofs of bark. Around the houses are piled bundles of firewood and charcoal. In winter the farmer cuts down trees and partly burns them to make this charcoal. He will sell his firewood and charcoal on the lowlands where the people need fuel. In summer he plants crops on the land he has cleared. He raises the food for his family.

Logging. All through these forests the cutting of timber is an important occupation. Most of the lumber is used in Japan. The Japanese generally use wood for building their homes. Even in the cities there are many small frame houses. These are built so close together that if a fire starts, many houses may be destroyed.

Some of the smaller trees are cut into short sticks and ground up into pulp in mills. Small, knotty trees make just as good pulp as tall, straight trees. The pulp is sent as raw material to factories in other cities. There it is made into paper, fiber, or *rayon*, a kind of yarn which can be made into cloth.

Kinds of trees. Japan has many different kinds of trees. This is partly because the islands are in different latitudes, and so the climates of the northern and southern islands are quite different. In Hokkaido and on the high mountain slopes of other islands, where the weather is cold much of the year, cone-bearing trees grow. Cedar, fir, and spruce grow in great numbers. In forests in other parts of the islands are many trees with broad leaves. Some are evergreens. Others are oaks and maples.

EWING GALLOWAY

This sawmill yard filled with logs is on the island of Honshu. Both hard and soft woods are brought to such mills to be cut into lumber.

There are also forests of bamboo, which the people cultivate for many purposes.

Some of Japan's forests are in mountainous regions where there are no roads. It would cost more to move the timber to cities and villages than the wood could be sold for. So it does not pay men to cut down the trees. In such areas you would find forests where no timber has ever been cut.

Protecting forests. The people of Japan know the value of their forests. Since wood is their chief building material, they have been taught not to waste it. Every year they plant young trees to take the place of those cut down. In this way there should always be new timber ready to be cut.

Even though much of Japan is covered with trees, the amount of wood for each person is small. It is not nearly enough for his needs. So Japan must take care of the trees it has and must import more timber for its people. During many years about one fourth of all the wood used has been imported.

A rainy land. When you learn that so much of Japan is covered with forests, you should know at once that it is a rainy land. Forests, you remember, do not grow in dry lands. All the islands of Japan have plenty of rainfall, and farmers need not worry about dry weather. There is not a single desert in the country.

The monsoons, which you have read about in the chapter on China, blow over Japan. In summer the southeast monsoon brings rain to Japan as it does to China. In winter the northwest monsoon also brings rain. Even though the winds are dry as they leave northeast Asia, they become warmer and wetter as they blow over the ocean. They are wet by the time they reach Japan.

FARMS AND FARM VILLAGES

A rice-growing region. Japan is in the world's greatest rice-growing region, the monsoon lands of eastern Asia. In this part of the world more than nine tenths of the world's rice crop is produced. Rice is the chief crop in Japan south of Hokkaido. Even in Hokkaido rice can be raised, except in the very northern and eastern parts. Few countries in the world depend as much as Japan on growing one kind of crop. Japan is sometimes spoken of as a one-crop country.

Here, as in China, rice is a subsistence crop. Everywhere in Japan you will find the farmers living simply and having little more than they need to keep alive. They live in villages and rent or own their fields.

The rice fields. Many farmers live on the lowlands of central and southern Japan. Here the climate is mild in winter and hot in summer. The summer rainfall is heavy, and there is plenty of water for rice.

A farmer's fields are usually scattered in many directions. It may take him as long as an hour to walk from one of his fields to another.

In May or June the farmer sets out his young rice shoots. As in China, the fields are small. They are kept soaked in water until the rice is ready to ripen.

When fall comes, the farmers begin to worry about their rice crops. September and October are the stormy months when the typhoons may come. Heavy rain and wind may beat down the stalks and do great damage to the ripening grain. The swift rivers may overflow their banks and flood the fields. Whole villages may be destroyed.

If everything goes well, by November

EWING GALLOWAY

A farming village on the island of Honshu. On the level land the farmers raise cabbages and other vegetables. Beyond the village on the lower slopes of the hills are rice terraces.

the crop has been gathered. The kernels are combed by hand from the heads of the stalks. These farms are too small for expensive machinery like threshing machines.

Besides lowland fields, there are hillsides with tiny fields rising one above the other like broad steps. Only by very hard work have the Japanese farmers made these terraces. They have carved out level areas on the mountainsides and built dikes along the slopes, so that they might flood each small field. Sometimes they have carried soil from the plains below to make their land richer.

In olden times farmers did not own their land. Even today many farmers pay rent for their rice fields by giving the owner part of the crop. For land that yields only one crop a year, the farmer pays about half his crop. For a two-crop field he often must give the owner three fifths of his crop. Then he has only two fifths left for his family. Unless he works hard to make his land produce well, his small share of the crop will not provide enough food for himself and his family. Also he must supply the seed, the tools, and everything else needed to grow the grain. He must provide the farm buildings and the house he lives in.

Most Japanese eat rice three times a day. Those who cannot afford rice eat cereals such as barley, but the Japanese do not like the cheaper cereals.

Other crops. Garden vegetables are widely grown in Japan. Next to rice they are the most important food of the people, for the Japanese eat little meat. In a single summer a farmer may raise several crops of vegetables on the same land. Sweet potatoes, beans, and peas are grown on almost all of the islands.

Close to the cities vegetables are raised

JAMES SAWDERS — COMBINE, AND EWING GALLOWAY

On the left is a courtyard and a small house with a roof of thatch. The gate with the tile roof is also a Japanese temple. On the right is the inside of a rich man's house. These beautiful sliding screens serve as doors in Japan. The painted flowers are cherry blossoms.

to sell. Melons and vegetables which spoil easily have to be sold near by. Japan has few refrigerator cars and trucks in which fruits and vegetables might be kept fresh while they are sent to distant parts of the islands.

On highland fields the farmers raise small grains such as wheat, barley, and oats. These fields, which are not irrigated, depend on the rainfall for their moisture. In the southern highlands grains are planted in the fall after the rice and vegetables have been gathered. But in the north, where the climate is colder, the farmer cannot use his fields all year round. He sows his grains in the spring.

The wheat and barley produced are used as food. The oat crop is usually grown to feed livestock.

Fruits are also grown on highland fields. Orange trees are a common sight on steep hill slopes in Kyushu, Shikoku, and southern Honshu. Since orange trees cannot grow where there are heavy frosts, the larger part of the crop is raised south of Tokyo.

Most of the trees are *mandarin* orange trees. Mandarin oranges are much smaller than the common orange and have a reddish skin that separates easily from the pulp. They are grown without irrigation.

Fruits that can stand cold winters, such as apples, are grown in northern Japan. Japanese pears are grown on the wet lowlands. Persimmons, grapes, plums, and peaches are also important fruit crops. In many of the country areas and in the city parks and yards, cherry trees are grown as much for their beautiful blossoms as for their fruit. Many Japanese go on walking trips to see the country when the cherry trees are in bloom. People from other countries like to visit Japan at cherry-blossom time.

In the hilly parts of Japan that are not too far north almost every farmer grows tea bushes and a few mulberry trees. Both are valuable for their leaves. Both give the women and children a chance to help make a living for the family. But besides the farms that produce just a little silk, there are large mulberry farms which have their own raw-silk factories.

Japanese houses. The Japanese house

seen in the villages and even in the poor parts of cities is usually a small frame building of about three rooms. It stands close to the street or road. The outside walls are not painted. The people like the brownish colors that are made on the wood by sun and rain. The roof is usually thatched with straw. In cities and a few other areas roofs of tile may be seen. Sometimes there is a porch across the front of the house. Generally the roof reaches so far out that it shades the walls.

The rooms are separated from each other by sliding screens instead of walls. There are few pieces of furniture. During the day the people sit on straw mats or cushions spread on the floor. At night thicker mats are spread on the floor for beds. People eat their meals from a tray or a low table about a foot high.

A rich man's house usually has two stories. It is built farther back from the street and is surrounded by a wall or a hedge. The rich man has a beautiful lawn and gardens and sometimes a pond in which brightly colored fish swim. He may have rooms which are used in only one way, like a bedroom or a dining room. In the poor man's house the main room is used in many ways. The few pieces of furniture and mats are brought out only when they are needed.

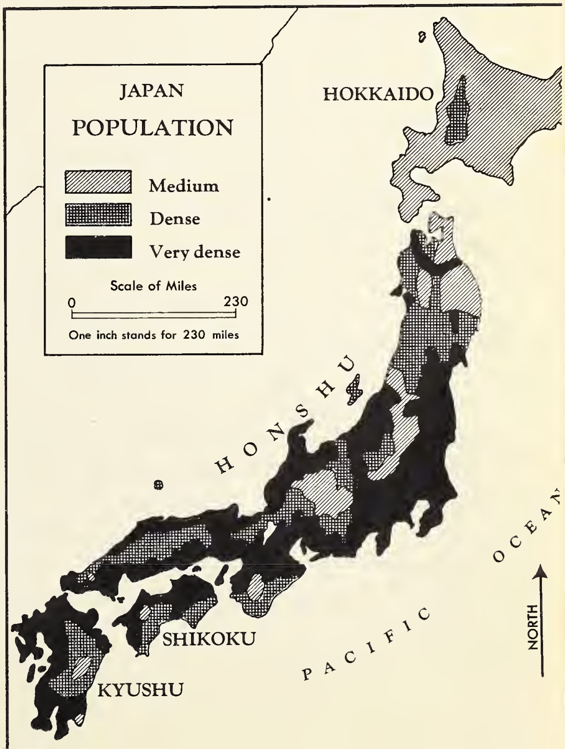
CROWDED LANDS

You will remember that the farm lands are scattered over Japan, often separated from one another by hills and mountains. Wherever there is a bit of lowland or a fertile highland area that is not too steep, the people have laid out farms. The farm lands are among the most densely populated in the world.

Think of a farm in Japan. One of the same size in the United States would seem to be a tiny farm or even a garden. A Japanese farm usually provides a living for twelve times as many people as a farm of the same size in the United States.

Look at this population map of Japan. Notice the key to what each kind of shading means. The most densely populated areas are the lowlands in the southern part of Japan, in Kyushu, Shikoku, and the southern part of Honshu. In Hokkaido, the climate is more severe. Living is harder. The farmers cannot produce large crops of rice and can seldom obtain two crops of rice a year. In only a few areas can they raise commercial crops such as tea and oranges. This explains why Hokkaido is not so densely populated as the other Japanese islands.

In Japan the best land is used for farms. Because the fields are spaded by hand, farmers can cultivate only a small area. If that area were not fertile, they could



not obtain a living from it. The oriental farmer must use his labor on fertile soil if he is to keep himself and his family from starving.

FISHING

You have learned that the people of Japan eat rice and very little meat. Perhaps you think that they eat little else except rice, but that is a mistake. They eat fish with their rice. The Japanese like fish, and it is their chief animal food.

There is a very good reason for this. The home islands are not rich in natural resources, and the people must have food. Most of the lowlands where the people are crowded are on the coast. So these people have become fishermen. Fishing is one of their important occupations.

Fishing grounds. The parts of the ocean where many fish can be caught are called *fishing grounds*. One of the world's best fishing grounds is along the eastern coast of Asia from Bering Sea on the north almost to Australia on the south. Find this part of the ocean on the map on page 152. Most of these waters are shallow. Even the waters off the eastern side of Japan are shallow for a little distance out from the coast before the sudden drop to the deep ocean bottom. You will remember that many more fish are found in shallow water than in deep water. This helps to explain why there are good fishing grounds near the shores of Asia.

The Japanese fish all through these waters as well as near their home islands. Other Asiatic peoples fish in waters fairly near their homes. No other people have carried on their fishing so far from home as have the Japanese.

In the ocean off eastern Asia warm waters from the south meet cold waters from the north. Such places, where the cold and warm waters meet, are very good for fish and have many different kinds of fish. Some kinds are most plentiful in the cold northerly waters, others in the warm waters from the south.

Fishing villages. The coasts of Japan are dotted with villages in which the families make a living partly by farming and partly by fishing. When there is no farm work to be done, the men may fish to add to the family's food supply. Fishing near the shore may be the chief occupation of the man the year round, while his wife and children farm the land.

In these villages you would see many little boats, nets, trays of drying fish, kettles for boiling fish, and an eatable kind of seaweed drying on racks. A large part of a fisherman's catch of fish is eaten by his own family. The rest is sold in near-by fish markets. You can see that where fish are plentiful, people can live even if they cannot grow enough food.

Of all the fish caught by the fishermen, the sardine is the most important. Have you ever eaten sardines? They are taken out of the sea with nets. They are used for oil, fertilizer, and meal. Only about a third of the sardines caught are eaten.

Next in importance is the herring. It too is used chiefly for oil and fertilizer, though part of the catch is used for food. Other fish obtained in large numbers are mackerel, trout, and cod. The Japanese also make much use of other sea products such as shellfish, chiefly shrimp and crab, and seaweed.

Commercial fishing. Not all Japanese fishing is carried on by subsistence fishermen. Fishing is also a big business. Indeed, Japan is the world's greatest fishing

EWING GALLOWAY

Fishermen all over the world hang their nets to dry on the masts of their boats. On the Inland Sea are many Japanese fishing boats like these. Families live on the boats the year round.

nation. Commercial companies send out their ships to the more distant fishing grounds. They often use large boats with modern engines driven by steam or gasoline or oil.

Some of the larger fish companies have ships that are really floating canneries. As fast as fish are caught, they are canned. These ships move over the northern Pacific and Bering Sea, canning the fish they catch. Salmon, tuna, and sardines, which are caught in great numbers, are canned on such vessels. These companies also make fish oil and fertilizer out of the fish which they do not can.

The commercial fishing companies land their products at a few large Japanese ports. Their boats are too large to dock at the coastal villages.

The world's fish supply. The world's supply of fish is slowly getting smaller. The ocean is so vast that you might think that there is little danger that the people in the world will use up all the fish. A single fish often lays millions of eggs, but many of them are eaten by other fish. Not every egg hatches out into a new fish. Some kinds of fish have become more scarce than they used to be. The supply of fish close to the Japanese shores is much smaller than it once was. As greater numbers of fish are needed, the fishermen have had to go farther out to sea to get fish.

Fish are a valuable resource. Modern countries whose people eat a great deal of fish do everything possible to keep plenty of fish in the ocean and streams. They must put young fish into lakes and rivers if they want to keep on taking full-grown fish out of these waters. Today even the fish that the Japanese catch far out in the vast ocean may have started life in some fish hatchery.

IN EARLY TIMES

Japan has long been a farming country raising great amounts of rice. In the early days, however, the land was used in a way very different from that of today. Then each island was divided into separate areas of small farms. Each area was owned by a *war lord*, or master. He had soldiers to help him in battle and *peasants* to till his fields. A peasant, you know, is a person who depends for his living on a small farm. When the peasant gathered his crops, he had to give a share to his lord for the use of the land. The lord ruled over his peasants like a king.

Little trade allowed. In those days there were few merchants in the country. A merchant is a person who makes his living buying and selling goods. In Japan few farmers or workmen produced more than their families needed for their living. But since the merchants produced nothing, they were looked down on as being one of the lowest classes among the people, lower even than the peasants.

At that time the Japanese were shut off from all the other peoples of the world. No one was allowed to build a ship which could travel on the ocean. No Japanese might visit a foreign country. Foreign missionaries were kept out of the country. Only a few foreign people, who were Dutch merchants, were allowed in Japan. They carried on a little trade at one southern port.

Government by the war lords. Japan had an emperor who was supposed to be the ruler of the country. However, he really had little to say about the government. A group of the most powerful and wealthy lords had made themselves the real rulers.

The peasants always obeyed their rulers without question. They were taught that the government was always right and that they must do exactly as the government asked. They worked long, hard hours for their lord but seldom had more than a bare living. Life went on in this way until about a hundred years ago.

These Japanese peasants work very hard to plow their rice paddies, using primitive hand tools instead of a plow. The tool used looks like a heavy pickaxe but has a long blade.

JAMES SAWDERS — COMBINE

BROWN BROTHERS

Commodore Perry's fleet as the Japanese may have seen it. These ships look like toys, compared with our warships of today, but in those days they were powerful warships.

Of course, the Japanese people, being out of touch with the rest of the world, had not learned to make and use machines. They had no railroads and not a single ship in which they dared to go out on the open ocean. Everything produced in the islands was made by hand or with simple tools. All the products were used within the country. Nearly everyone lived on a farm or in a small town. Large cities were few.

In other parts of the world people were learning to live in much more advanced ways. In western Europe and the United States factories had been built which produced many kinds of goods. Through trade the people were supplied with articles from other countries. Every day they used things that the Japanese had not even heard of.

A change comes. Slowly the merchants became more important as they were able to sell more and more goods. Now they wished to trade with foreign countries. They were not satisfied with being shut off from the rest of the world. A new group of Japanese lords became powerful and took over the rule of the islands.

Commodore Perry visits Japan. At about the same time Commodore Perry from the United States visited Japan. A commodore, you know, commands a fleet of ships. Commodore Perry was sent with a part of our fleet to demand that Japan open its ports to foreign trade. The Japanese rulers saw that they could not protect themselves against foreign fleets unless they built modern ships of their own. Even though they lived on islands, they could no longer keep their country shut off from peoples of other lands. They saw that their weak country could easily be overcome by modern countries with their great ships and new weapons. Very strong nations, called *world powers*, might even make Japan into a colony.

Japan opens its doors to trade. When Commodore Perry came to Japan, the new rulers of Japan decided that the Japanese people must change their ways of living. They also decided that Japan must

JAMES SAWDERS—COMBINE

A pineapple field in Hawaii. Busy Japanese workers are picking and crating pineapples.

become a great world power. The first step was to open the country for trade with foreign merchants.

Industry begins in Japan. Until this time the Japanese had been farmers. They knew nothing about manufacturing. But the rulers saw that only an industrial nation could become a world power. Industry was needed to produce things to sell so that the Japanese would have income to buy things produced by other countries. Industry was needed to provide ships and railroads. Also, the Japanese rulers wanted an industry that could manufacture weapons for war.

First the government had to get money to build factories. It collected taxes from the people and borrowed money from wealthy Japanese. Next it brought in foreigners who knew a great deal about factory work. These men came to direct the building of factories and the training of the factory workers. The government also sent some of its own men to foreign lands to learn how to carry on important industries. Soon it had good factories running well and producing such things as cotton cloth and silk thread.

The factories grow larger. In the year 1914 many countries in the world went to war. We call that war World War I. It lasted four years. Although Japan took part in the war, not many of its people were fighting. Other nations, however, had such large armies that there were too few men left to work in factories. These nations could not manufacture all the things they needed. So Japan began to manufacture articles for export. Since the warring nations particularly needed food for their soldiers, Japan began to sell them canned fish. Canning of fish became an important Japanese industry.

During this war Japan could not import as much goods as it needed. It could not get medicines or buy machines for its factories. Therefore, Japan began making things that it had not produced before.

Its industries grew rapidly. Even after the war was over, the Japanese kept on making these new articles.

After World War I Japan's industries kept on growing. Workers in the factories learned how to do their tasks quickly and well. They produced larger numbers of articles in less time than before. Even so, most of Japan's industries did not equal those of western Europe and the United States.

Some of Japan's factories were small, with only five or six workers. Others were large, with hundreds of workers. The government, you see, had started manufacturing in a small way. As its people learned more and more about using machines, it started more and different industries. Many of these industries grew very large. In less than a hundred years Japan was changed from a farming country to an industrial nation.

The Japanese could sell their factory products very cheaply. The low prices were possible because the men and women worked long hours for small wages. People in Asia who had never before bought manufactured articles now began buying them from Japan. Japan's industries grew steadily, and the Japanese built up a good trade with other countries.

The new lords still ran the country. The Japanese peasants had little to say about their government. They were not allowed to think for themselves. Except for those who moved to cities to work in large factories, their way of living was about the same as that of their grandparents.

MAKING COLONIES IN FOREIGN LANDS

The new lords saw how crowded the country was. There was not enough farming land to produce food for all the people. Year by year the land was becoming more and more crowded. For two hundred years the Japanese had not been allowed to leave their country and make homes in other lands. To give the farmers more land the rulers asked a part of the population to leave the country and form colonies in other parts of the world. Japan might then trade with these colonies. In time of war it might need their help.

Japanese settle in other lands. In addition, many Japanese went to the Hawaiian Islands. These islands are in the Pacific Ocean almost four thousand miles away from Japan. They belong to the United States. Find the Hawaiian Islands on your globe. There the Japanese worked in the sugar cane and pineapple fields. Other Japanese went as farm workers to Canada and the United States.

Shortly after World War I the United States refused any longer to admit Japanese settlers into this country. But the Japanese were settling in parts of South America, in the tropical islands off southeast Asia, and in Asia itself.

Many settlers return to Japan. Some of these new lands had cold climates not good for raising rice and the other crops which the Japanese were used to growing. Regions having warmer climates were often closed to the Japanese. Many of the people who had left Japan later returned because they did not like the country to which they had gone. In some years the number of people returning to Japan was greater than the number leaving. So you see that the farm lands in Japan were still crowded with people.

Japan makes war for new lands. The government tried to gain new lands by making war on other nations. First Japan

PHOTO FROM EUROPEAN

This is what happens when countries go to war with one another. During World War II, great areas in many of Japan's cities were destroyed.

took the island of Formosa from China. It also conquered the small country of Korea, which had become free from China only a short time before. Then Japan attacked China, took away Manchuria, and occupied most of the east coast of China. The war lasted for many years, because China would not give up trying to drive the Japanese out of the territory they had taken.

These new lands which Japan had seized were rich farm lands. But the rulers of Japan were not satisfied with taking Formosa, Korea, and Manchuria. Japan wanted much more. It wanted enough natural resources to provide all the raw materials for its factories without buying from the rest of the world. We say that Japan wanted to become *self-sufficient*, and it did not care how it did so.

The home islands of Japan have fewer raw materials than any other leading industrial country in the world. Japan is very poor in mineral resources. For example, it has little petroleum to use as fuel. It has less copper than it needs for modern industries.

Japan planned to seize the lands it wished, no matter who owned them. Therefore, it did not use its factories to make things which its people needed. It did not try to give its big population a better living. Instead, Japan began to manufacture weapons with which to make war.

World War II. Finally Japan attacked islands in the Pacific Ocean which belonged to the United States and other nations. At first Japan was successful in conquering many regions of tropical southeast Asia. For a time it held Java, the Philippine Islands, and all the neighboring islands. Japan hoped to make these rich lands part of a great new Japanese empire.

This terrible war lasted for more than three and one-half years. To defeat Japan the United States and its *allies* had to destroy Japan's ships and many of its industrial cities. Allies are countries fighting on the same side in a war. Finally Japan's home islands were occupied by United States soldiers. The soldiers made sure that Japan could not again make war on peaceful peoples. Instead of an empire, Japan gained for its people only hardship and suffering and the loss of its industry.

EDWARD C. HUDOWALSKI

Peace after war in Japan. This picture shows a food market in Tokyo. A nation's resources should be used for the good of its people.

WORKSHOP TRADES

Long before manufacturing was begun in Japan, the people had workshops in which they produced a few articles at a time. Because the Japanese were separated from other peoples for hundreds of years, they developed their own ways of living. They like such foods as rice cakes, noodles, and boiled rice with fish. The women buy these and other foods already prepared. Wooden shoes are still worn by many people. Most Japanese women who work inside the home wear Japanese clothes. Many of the articles which the Japanese use every day are made in workshops.

Making things at home. Scattered through the country are hundreds of these small workshops in people's homes. The members of the family with perhaps a hired helper or two are the workers. The helpers live with their masters. In these workshops simple tools are used. The workers seldom use machines that are run by power.

Often the products of these small workshops are peddled in the neighborhood by some member of the family. Sometimes the articles are sold in a shop in front of the dwelling house. Such shops are seen in almost every village. Even in large cities they are crowded into tiny spaces between the homes of wealthy people.

The use of native Japanese goods is not so great today as in early times. The rich Japanese are becoming used to food like that eaten in Europe and the United States. They buy it in restaurants in the larger towns. Many young children wear clothes like ours out of doors. So these workshop trades are becoming less important.

Working with lacquer. Perhaps you have seen *lacquer* bowls, trays, screens, or low tables made by the Japanese. Lacquer is a kind of varnish made from the sap of a Japanese tree. It has no color of its own but is often mixed with colors, especially black or dark red. Articles made of wood, porcelain, or metal are covered with a coat of lacquer. They are next dried and polished. Then another coat is added. Often as many as thirty coats of lacquer may be used. The article is polished after each coat. Lacquer ware has been made for hundreds of years in some of the old cities of Japan. Some

FRITZ HENLE FROM MONKMEYER

Workshop trades. On the left is a Japanese shoemaker at work in his shop. On the right is a Japanese glove factory. These workshops produce many articles needed for peaceful living.

cities produce cheap lacquer ware for everyday use. Others produce ware so beautiful that it has been purchased for the famous museums of the world. Find Kyoto on the map on page 222. Kyoto turns out lacquer ware of fine quality. Screens which are made there take years of work and have been sold for hundreds of dollars.

Much of the Japanese lacquer ware is made of cypress wood. The wood is shaped by machinery in small factories. The rest of the work is done by hand in small home workshops. The lacquer ware may be sold by a merchant, a small store, or even a large department store.

Making pottery. For hundreds of years the Japanese have made beautiful pottery and porcelain wares. When they began to trade outside their country, their pottery was greatly desired by foreigners. It became one of their exports. Along with simple pottery for the Japanese trade, new kinds were made for people of other countries.

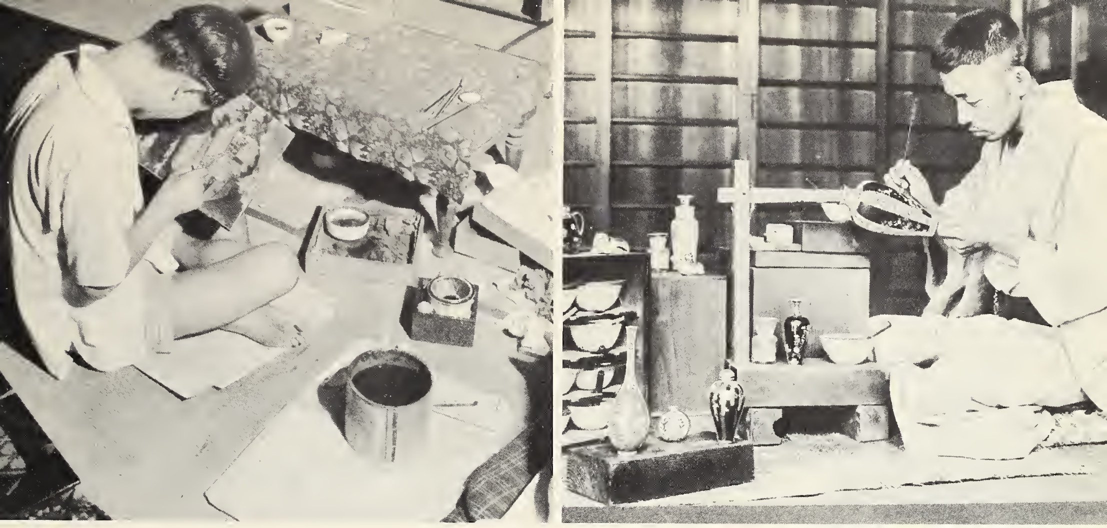
Find the city of Nagoya on the map on page 222. About three fifths of Japan's pottery is made here. Kyoto is also a pottery center.

Most pottery is made in small workshops hiring ten to a hundred workers. They make fine porcelain as well as rougher pottery, for table ware and ornaments.

Each small workshop does a particular part of the work. If a merchant wants a tea set, he will order the cups to be made in one shop, the saucers in another, the teapot in another, and so on. Most of these shops will turn out the white clay body, as the piece is called after it is shaped. The decorating is then done by finishing workshops. When the tea set is completed, the merchant delivers it to a store or an export company.

In Kyoto the pottery makers produce Japanese tea sets or rice bowls that are very beautiful. The customer knows by looking at them that they were made by artists. Not all of them are expensive. Many are found in Japanese homes.

Other small trades. Besides these old



H. ARMSTRONG ROBERTS AND BLACK STAR

The picture on the left shows a Japanese artist painting with lacquer on a small screen. On the right is a pottery painter. Japanese artists take great pains with their work.

trades the Japanese work at new trades which they have learned from other countries. They make electric lamps, bicycles, toys, stockings, rubber goods, small metal goods, and other articles. These are produced mostly in small workshops. Much of the work is done by hand or with the help of simple machines.

MANUFACTURING

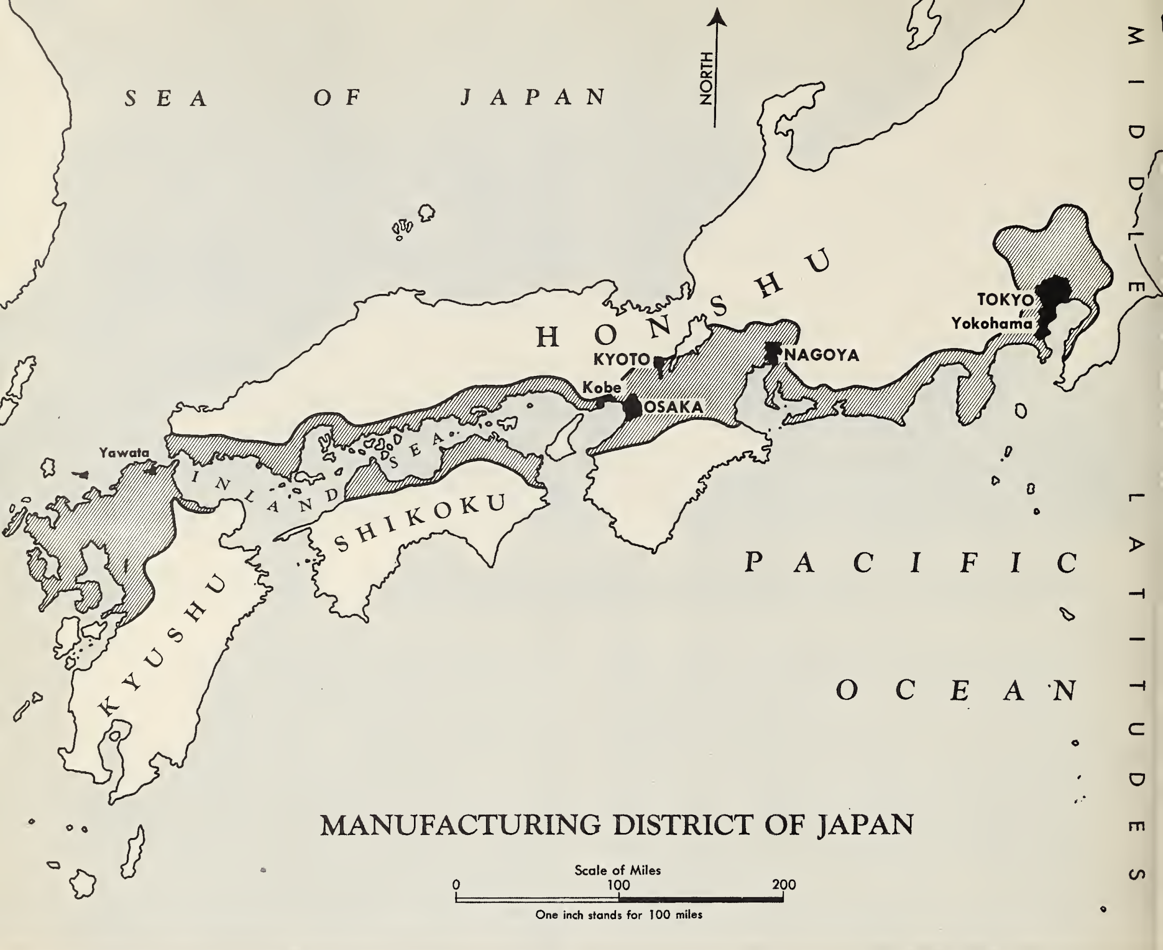
Manufacturing, the making of things in large quantities by machinery, is a very important occupation of men the world over. Millions of people depend upon manufacturing for their food, clothing, and shelter. Even people who live in primitive ways, such as the Navajos, may use some manufactured articles. Manufacturing depends, of course, on other occupations, since raw materials are needed for factories, food for workers, and markets for selling factory products.

All modern nations carry on a large amount of manufacturing. But a great part of the world's manufacturing is done in two regions. They are western Europe and northeastern United States.

Work in factories, you know, is done mostly by machines. The workers in the factory run the machines. Raw material may have to go through many machines before it comes out as a finished article. When men start a factory, they have to know what kinds of machinery to use, how to arrange the machinery, how to run it, what kind of raw material to buy, how many factory workers are needed, and many other things.

You have learned that Japan brought men from other countries to start its industries. You know, too, that these industries grew very fast before World War II. Like Europe and the United States, Japan built its factories in cities.

The industrial region of Japan. Notice on the map on page 229 that the population is very dense along the Pacific side of southern Japan. Most of Japan's large cities are in this region. It is the chief industrial and commercial region of Japan.



MANUFACTURING DISTRICT OF JAPAN

Almost all the modern manufacturing in Japan is done on the delta plains in the south. The Kwanto Plain, you remember, is the largest of these. See the manufacturing district on this map. It includes the southern part of Honshu, the northern part of Shikoku, and the northwestern part of Kyushu. No other part of Japan is so easily reached, either by ships from foreign countries or by persons living in the home islands. Notice that this manufacturing district lies along the coasts. The many bays make good harbors for ships. Find the Inland Sea just south of the largest island. Ships in the Inland Sea are protected from high waves in time of storm.

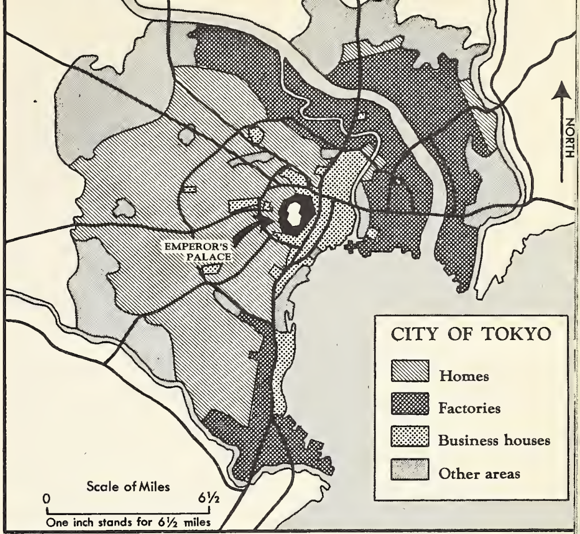
Some of the earliest railway lines in the country were built in this region. This is not strange, because railways usually lead from one densely populated part of a country to another. The only railway in Japan that has a double track over its entire length runs from Tokyo through this manufacturing district.

Tokyo. On the map of the manufacturing district of Japan find Tokyo, the capital city. It is located on a narrow bay of shallow water. The map of Tokyo on page 241 shows you that the city faces southeast on the bay. Notice that the city spreads inland over a large area, chiefly north and west. There are only four cities in the world that cover more land. In population Tokyo is one of the largest cities in the world.

After the great fire which followed the earthquake of 1923, nearly half of this Japanese city was in ruins. The central part of the city was built again on a new plan much like the cities of the United States. Wide streets were laid out instead of the narrow ones usually found in oriental cities. Bridges and office buildings were built with steel and concrete so that they could not be shaken down by earthquakes or destroyed by fire. Modern stores and banks were also built in downtown Tokyo. Because of the danger from earthquakes, few of these were more than eight stories high.

Notice the key of this map. Tokyo has three main parts. Two of them, the business and factory districts, are on the east side. This is the low plain of a river. Before World War II most of the factories were built along the bay or on the canals and rivers draining into it. Thousands of factory workers used to live in the manufacturing district of Tokyo. The western part of the city, where many people had their homes, is higher land. Steep streets lead up from the eastern plain to the western highland.

Why do you suppose factories were built on this lowland? If you had visited Tokyo before World War II, you would have seen that the eastern part had hundreds of bridges crossing the canals and rivers. Many downtown buildings were built on *piles*, or posts, driven deep into the low moist land or even into the water. Fuel and raw materials could be brought in small boats to many factories.



EWING GALLOWAY

The theatre and business districts of Tokyo. A modern highway runs along this canal.

In World War II much of Tokyo was again destroyed. The United States again and again bombed the factory areas, where war materials were being manufactured. Many bombs fell also in other districts. Great fires swept through the areas where people had their homes. But Tokyo is again being rebuilt into a modern city, a city that will be better and safer for its people.

More than three hundred years ago Tokyo was made the home of the emperor and the government. Find the emperor's palace on the map. It is on the eastern edge of the plateau near the middle of the city. This is one of the buildings that were not destroyed by the great earthquake and fire. It is in the middle of a park which also has several modern government buildings. Some of these buildings were damaged in World War II, but the palace itself was not harmed.

As in other Japanese cities the small shops open right on the street. They have no doors or windows. At night the store fronts are boarded up. Many stores have rooms for the owner and his family in the back or upstairs.

Yokohama. The bay on which Tokyo lies is too shallow for ocean vessels. When Tokyo became the capital, the Japanese wanted a city with good roads to other places in the home islands. The boats that were used for trade between the home ports were small enough to move in shallow waters. Later, however, as ocean transportation grew and ships became large, the capital needed a larger and deeper port. Then Yokohama, halfway to the open sea, was built as Tokyo's port. Yokohama is a newer city than Tokyo, but it is not nearly so large. It is an important port for foreign trade. The cities on the Kwanto Plain and even those in northern Honshu send their products to Yokohama for shipping. Foreign goods also are received there.

A Japanese comic strip. The man changes the pictures and tells the children the story.

AL NEWMAN FROM EUROPEAN

Yokohama has water deep enough for the largest ocean-going boats. Much of its trade is across the Pacific with the United States.

There are many small workshops in this lowland city. Before World War II large modern factories were also built in Yokohama because of the good transportation by railroad and deep-water canals. Many of these factories, like the factories of Tokyo, were destroyed in World War II.

Other cities. On the Kwanto Plain are many other industrial cities, no older than Yokohama. Before World War II these cities had many factories. Some were large factories that made steel and steel products, airplanes, weapons, and ammunition for war. Now smaller factories in these cities make products for peaceful trade, such as cloth and electrical goods.

At the eastern end of the Inland Sea are three other great manufacturing cities, Osaka, Kobe, and Kyoto. Kyoto was once the capital city of Japan. Find each of these cities on the map on page 240.

TEXTILE INDUSTRIES

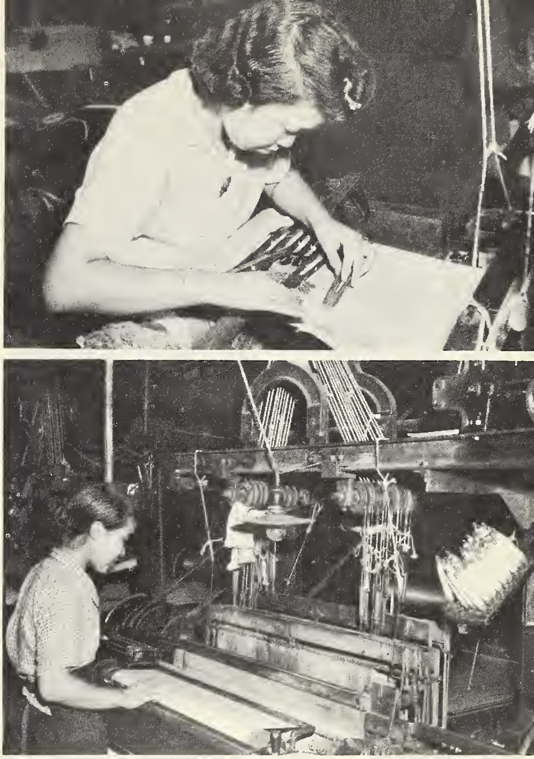
Most of the things we wear are made of cloth. Did you ever ask yourself what cloth really is or what it is made of? Perhaps you have noticed that cloth is made of a great many fine threads. When threads are woven over and under other threads, they hold one another together and make cloth. All kinds of cloth are called textiles, and most textiles are made of thread. Do you know what thread is made of? It is made of fibers that come from plants or animals or from minerals found in the earth.

Silk manufacturing. You have already read that Japan raises silkworms which produce silk fiber. Many Japanese earn their living by reeling silk and by weaving it into soft silk cloth. You remember that reeling silk means the unwinding of silk from the cocoons and the twisting of the threads. In Japan it is done mostly by machine. Few of the reeling factories are large. They are scattered over the country. Many of them are located near the mulberry farms where silkworms are raised. Only a few are in Hokkaido. Can you tell why this is so? Remember that mulberry trees need a warm climate much of the year.

Silk weaving is done mostly in workshops. This work is not usually carried on in the great cities. Nearly all of the workshops are in small towns and villages scattered over the country. Most of them use machines run by power, but a few use hand looms.

Rayon. Rayon goods are much used today instead of silk. There are many different kinds of rayon cloth. Some look almost like fine silk, but other kinds have a dull finish like wool.

Rayon is made from wood pulp and the short fibers around cotton seeds. The pulp is obtained from spruce and pine trees. So you see rayon, like cotton and linen, comes from plants, not from animals as do wool and silk.



EWING GALLOWAY

In the factories of Japan, some beautiful textiles are woven by hand. But hundreds of power looms weave cloth for ordinary use.

Large modern Japanese factories weave great quantities of rayon cloth as well as pure silk goods. Sometimes rayon yarn is mixed with silk or cotton thread.

Japan is able to produce rayon yarn or goods very cheaply because of the low wages it pays its factory workers. The workers in a Japanese rayon factory labor many hours a day for small wages. They receive much less than workers in the rayon factories in the United States get for their work.

The rayon cloth is sold to Japanese

EDWARD C. HUDOWALSKI

Wealthy Japanese girls wear very costly and beautiful clothes made of silk and rayon.

women both rich and poor. Much is bought by the poorer people of southeast Asia. Oriental people like garments made from shiny rayon. Since the cloth is produced and sold cheaply, the poorer people can afford to buy it.

For rayon cloth used in the home islands, Japan obtains its wood pulp from its own forests. For rayon of better quality, which is sold to foreign countries, Japan purchases its pulp from other lands.

Nylon. Since 1939 a new kind of textile called *nylon* has been sold in the United States. It is made from coal, water, and air. Nylon fiber is tough and strong. It can be spun into very fine fibers. When nylon yarn is washed, it dries much faster than other materials. So nylon is very good for clothing and for many uses where great strength is needed.

Nylon was first used in making stockings. But today nylon fibers are made into many articles. Japan with its many people can easily manufacture nylon at low cost, even though the coal used must be imported.

Cotton textiles. Although cotton is not raised in Japan, the manufacture of cotton yarn and cotton cloth is one of Japan's chief industries. Where do the Japanese get raw cotton for their factories? They import it from foreign regions. Japan would like to produce cotton, but the Japanese have not found a kind of cotton that will grow in their country.

The raw cotton is spun in large mills. The machines used in the larger mills are of the most modern kind. Much of the cotton-spinning industry is carried on in Japan's chief industrial region. Find this region again on the map on page 240.

The weaving of cotton is done mostly in plain bare buildings. Often they are only sheds. But the machinery is likely to be modern, especially in the bigger plants. Not all such factories are in the largest cities. Many are in small towns or villages just outside a city.

By manufacturing cotton products, Japan supplies work for many of its people. It can import raw cotton raised in other places and skillfully make the cotton into different kinds of textiles for export. Japan exports large quantities of cotton products.

Woolen textiles. Not much woolen yarn is produced in Japan, and most Japanese clothing is made of silk, cotton, or rayon. There are not many mills for spinning wool in the country. The weaving is done in small plants with only a few looms. But the use of woolen cloth is becoming more common in Japan.

HEAVY INDUSTRIES

In modern countries no industry is more important than making iron and steel. When the Japanese government wanted to become a world power, it knew that its people must develop this industry. Iron and steel are used in many ways. The frames of large business buildings should be made of steel, especially in a land where there are earthquakes every day. Iron or steel are necessary in making rails, pipes, tools, and machinery. Steel is also the chief material used in trains, street cars, and automobiles. The tracks upon which trains and street cars run are mostly of steel. Iron and steel are used in building bridges and tunnels.

Before World War II Japan made many kinds of machinery which a short time before were produced only by people who live in Europe and America. Textile machinery, railway engines, airplane engines and many kinds of motors came from its factories. Thousands of men and women worked in these factories.

Japan had shipyards which built every kind of boat, from small coastal vessels and submarines to great ocean liners and battleships. These shipyards were mostly near Yokohama.

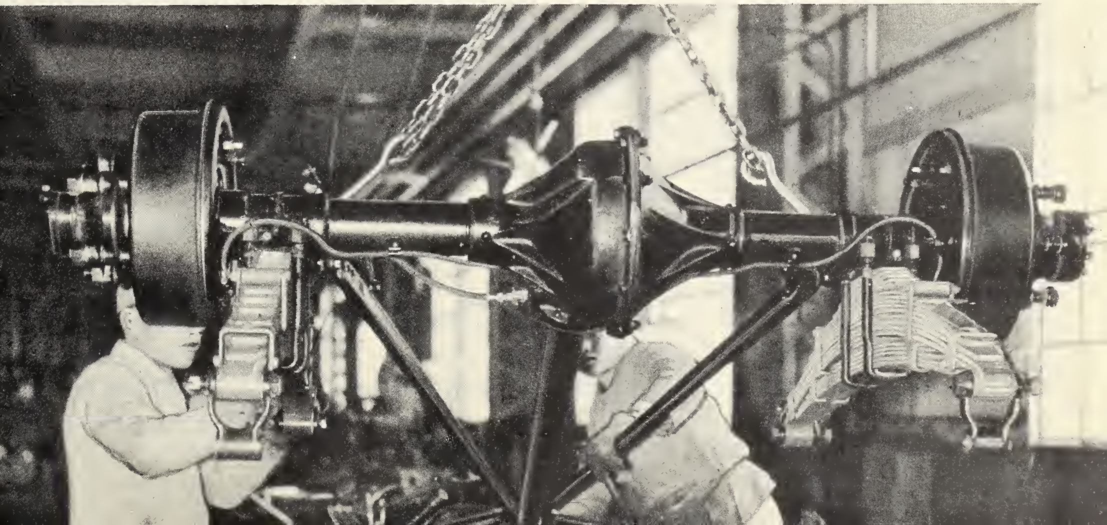
Heavy industries now in Japan. The Japanese industries that aided in making war were stopped by the United States and its allies. Now Japan is being helped to develop industries that will feed, clothe, and shelter its people. Large factories produce fertilizer, cement, glass, paper, and other articles.

As in many other countries the most valuable resource of Japan is the work of its people. But because the farming lands are so crowded, the people cannot supply their wants from the soil alone. If Japan can import enough raw materials, its people will have plenty of work. They will then be able to manufacture articles for export.

New industries. Japan may be allowed to have a small iron and steel industry to produce small tools and light industrial machines. However, Japan must continue to build new industries. These industries must be the kinds that will provide enough work for the Japanese people and better ways of living.

Heavy industry in Japan. These men work in a truck factory. They are placing the rear axle and spring on the frame of a heavy truck. The frame is upside down as they work on it.

J. P. L. PHOTO FROM BLACK STAR



EWING GALLOWAY

Modern transportation in a Japanese city. People wait for a streetcar on concrete safety islands, just as many Americans do. The women use parasols to shade them from the sun.

TRANSPORTING PASSENGERS AND GOODS

After articles are made in factories, they must be taken to market. Often they must be transported a great distance. Many products made in the southern part of Japan are sold to persons living in Hokkaido or even far-off countries like the United States.

Not all parts of the world have rapid and good methods of transportation. In this book you have read of areas where men must carry heavy loads on their backs for many miles. They carry goods along steep trails that are just worn paths where other men have walked before. Such paths cost nothing. But good highways are costly because much work and material are needed to build them.

You have read of other regions in which strong animals like the camel, the ox, the donkey, and the horse carry heavy loads. A wagon or a cart may be hitched to a strong animal and kept on a road that is not too steep. The animal can pull a heavier load than it can carry on its back. More than one animal may be hitched to the vehicle. Then all the animals move it by working together.

Most countries have railroads to carry products from the place where they are grown, mined, or manufactured to the place where they are used or sold. These countries also have trucks to carry goods to the railroad and from the railroad. Let us see how Japan transports its goods.

Roads. In Japan good roads are found only in the neighborhood of the great cities. The other roads are narrow, winding, and steep. On the plains the roads are several feet higher than the paddy fields.

In Japan most of the traffic on the

HOLLYMAN FROM MONKMEYER

Thousands of bicycles are used in Japan for many different purposes. This man pulls a trailer cart behind his bicycle. He uses the cart to transport materials from one factory to another.

roads moves slowly. Automobiles and gasoline cost too much for the many poor Japanese to afford them. It is hardly safe to drive on the country roads in an automobile. If two cars meet, they may find it hard to pass each other.

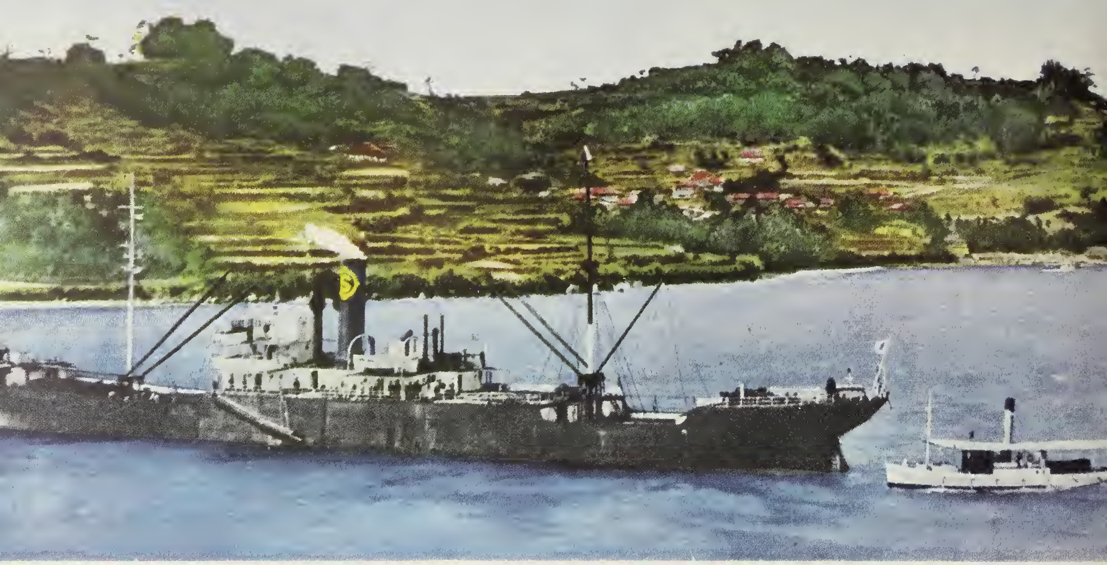
Instead of automobiles, visitors to Japan see bicycles and carts and wagons drawn by a man or an animal. Many persons walk along the rough, crowded highways. They go on long walks for pleasure as well as business — to mountains, to lakes, to sacred places such as temples, and especially to blooming groves and gardens. Buses travel between cities, but few trucks are used.

Railroads. Japan's railroads have long been better than its highways. The railroads are much used by the people, even for short trips. You will remember, however, that only one railroad, the one connecting the Kwanto Plain with cities along the Inland Sea, is a double-track road all the way.

Trains do not travel as fast as those in the United States. They do not carry so many passengers. Because of the steep slopes and many curves in this hilly country, a locomotive pulls only a few cars. There are so many tunnels through the hills and mountains that a passenger's view is cut off again and again.

There are not so many freight cars in use as passenger coaches. Only small amounts of goods are transported by train. Goods transported by land are usually carried on the backs of men or animals, on bicycles, or in carts.

Air lines. Would you expect air transportation to be well-developed in a narrow mountainous country such as Japan? The great cities of Japan are not far distant from one another. Indeed, Japan does not need air transportation within



EWING GALLOWAY

Large freight steamers like this one carry great quantities of goods along the coast of Japan between the chief cities. Beyond the ship you can see rice terraces cut into the hillside.

its area so much as a larger country might.

Before World War II the chief air lines run by Japanese companies joined Tokyo and Osaka with cities in Hokkaido and in north Kyushu. Short lines reached out from Tokyo to the west side of the islands along the Japan Sea. Service across the sea was provided to China and other parts of southeastern Asia.

Water transportation. The Japanese seldom travel or transport goods on rivers and canals as do the Chinese. The streams are too short, too swift in the mountains, and too shallow after they reach the plains. The only important transportation by small boats is on the waterways near the great cities. Here boats carry freight to the factories and business houses.

Perhaps by this time you are wondering just how the Japanese transport goods to their own people. If few goods are carried by railroad, or by river and canal boats, what means of transportation are used? The sea along the coast is the main highway of Japan. Thousands of steamers and sailing vessels journey along the coast between the chief cities. They provide regular shipping service.

Along the coasts are hundreds of ports, some large but many small. Vessels of different sizes and kinds crowd these ports. Some of these vessels have come from nearby regions bringing vegetables, fruits, logs, firewood, charcoal, fish, and other products. Others come from great ports such as Yokohama, bringing products of Japanese factories and imports from distant lands.

Before World War II fast, modern merchant ships traveled eastward across the Pacific for trade with ports in western North America. Others traveled to South America. Still others went to western Europe, to India, to the islands of the South Pacific, or to other regions. Ever since Japan opened its ports to foreign trade, it has wanted its people to have a big world trade. But in World War II most of Japan's ships were destroyed.

EWING GALLOWAY

Boats and steamships of all sizes and shapes go in and out of the great harbor of Yokohama. Steamers unload their cargoes at docks on which large warehouses have been built.

Things to remember. You should remember that slow, primitive transportation is found in Japan along with rapid, modern transportation. The country roads are narrow and rough. There are few trucks and passenger cars. The railroads and shipping services, however, are modern. But the transportation most often used from place to place in Japan is by small coastal vessels.

TRADE WITH OTHER COUNTRIES

Japan is an industrial nation which imports raw materials such as ore and raw cotton. It also imports metals. What would you expect Japan to export? The things it makes, of course — cotton goods, silk thread, and small machines.

Before World War II Japan's foreign trade was mostly with eastern and southern Asia, especially China, and with the United States. To Asia went manufactured goods. To the United States went raw silk and cheap factory products.

Most of this trade was carried on through a few Japanese port cities. The three leading ports were Yokohama, Osaka, and Kobe. Find each of them on the map on page 222. More than four fifths of Japan's trade passed through these cities. They were the great ports of Japan, and they served the whole country.

Although Japan had long been a farming country, in less than a hundred years it became an industrial land. But it went to war to take lands belonging to other people. Because of this, many of its cities, most of its industry, and almost all of its ships were destroyed. It lost all the foreign trade it had built up.

Now Japan is again building its cities and factories and again starting to build up a foreign trade. But these new factories are the kinds that produce goods for peace. The trade is peaceful trade. Japan is building its industry to give its people a better living, not to make war on others. It is trying to find a place among the peace-loving nations of the world.

Being a Junior Geographer

Study the picture on page 247. Then give five reasons why it was a good idea to use a bicycle in this way. (Clues: Does Japan have much gasoline? Is the road good? In Japan is the distance between small factories likely to be great? Can the trailer hold more than a man could carry? Does the trailer look as if it cost much to build?)

GIVE THE BEST REASON

1. A small river builds a small delta because: (*a*) it can carry only a little soil; (*b*) it flows more slowly; (*c*) fewer boats use a small river than a large river.

2. Japan has many forests because: (*a*) it lies in the middle latitudes; (*b*) it gets much rain; (*c*) all parts of the islands are near the ocean.

3. Farmers who live near large cities are likely to grow vegetables instead of crops like wheat or corn because: (*a*) the soil is richer; (*b*) people in cities like to buy fresh vegetables; (*c*) corn and wheat will not grow near cities.

4. Japanese forests always have many trees because: (*a*) the Japanese do not use much wood; (*b*) there is a law against cutting trees; (*c*) each year new trees are planted to take the place of those cut down.

5. The Japanese eat many fish because: (*a*) they do not like meat; (*b*) they do not have enough rice; (*c*) there is not enough land for large herds of cattle.

6. A nation will have a fairly simple way of living unless it can get iron and steel for: (*a*) guns; (*b*) foreign trade; (*c*) almost every kind of industry.

7. In Japan much freight is moved by coastal shipping because: (*a*) Japan is a mountainous land with a long coast line; (*b*) fishing vessels can be used to haul freight; (*c*) Japan has many sailors.

8. Japan does not have long rivers because: (a) it does not rain much in Japan; (*b*) the islands are mountainous; (*c*) the islands are not very large.

WORDS TO DEFINE

mandarin orange
fishing grounds
shellfish
floating cannery
world power
earthquake
landslide
lava
erupt
cod
shrimp
crab
steel
lacquer
volcano
sardine
herring
mackerel
livestock
peasant
warlord

FINDING CLUES IN PICTURES

1. Page 236. What tells you that this was probably a factory district?

2. Page 241. What tells you that Japan has many methods of transportation?

3. Page 243. What tells you that many Japanese have a complex way of living?

4. Page 244. In what season could this picture have been taken?

5. Page 245. What tells you that the Japanese are skilled workmen?

6. Page 246. Why does this picture prove that many Japanese have modern ways of living?

AN EXHIBIT

Prepare an exhibit of different kinds of cloth. On a table show samples of cotton, silk, wool, rayon and nylon cloth. Beside each sample place a card giving its name and interesting facts about the cloth.

WORKING WITH MAPS

1. In what direction would you go if you wanted to travel from North America to Japan by ship? By plane? Why?
2. Name the ocean that lies between Japan and North America.
3. To which continent is Japan closer, Asia or North America?
4. Is the distance from Japan to North America short, long, or very long?
5. Name the sea that lies between Japan and China.
6. Between what two circles does Japan lie?
7. Is Japan in the high, middle, or low latitudes?
8. Name a people who live farther north than the Japanese. A people who live farther south in the northern hemisphere.
9. Which covers the greater area, Japan Proper or Manchuria? Japan Proper or Greenland? Japan Proper or India?
10. Turn to the map on page 152. Using the scale of miles, find out about how far it is from the equator to the northern tip of Hokkaido. Do the same for the southern part of Kyushu. About how many miles is it from southern Kyushu to northern Hokkaido? To find this you need only subtract the smaller number of miles from the larger. How does this difference help to explain why different crops are raised in northern Hokkaido and in southern Kyushu?

QUESTIONS TO TALK ABOUT IN CLASS

1. Name four occupations of the Japanese and tell why each is important. Which occupation was developed latest?
2. Most of the ports to which the commercial fishing companies bring their fish are on the Pacific side of Japan. Explain why.
3. What great change has occurred in Japan during the last hundred years?
4. Give two reasons why Japan has wanted to get more land.

CAN YOU REASON?

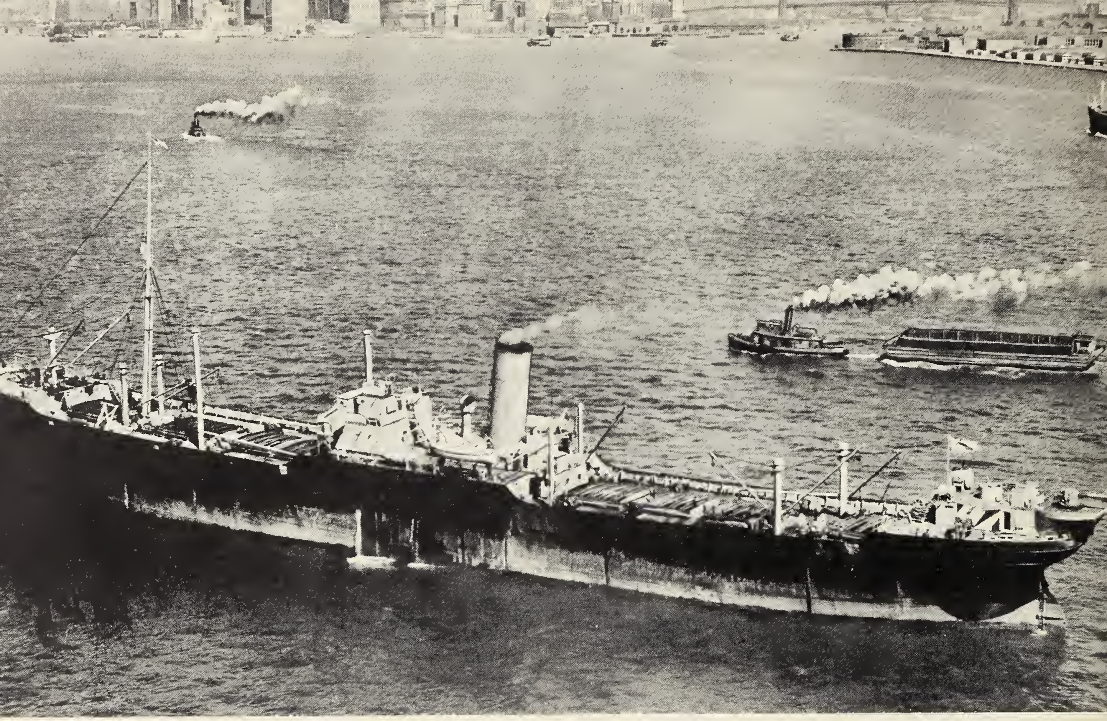
How are Tokyo and Yokohama like Canton and Hong Kong? If you cannot answer, study pages 210 and 242.

WRITING WHAT YOU HAVE LEARNED

1. Write the names of the four main islands of Japan, beginning with the largest island, the next largest, and so on.
2. Copy on your paper each of the following of which Japan has plenty. Do not copy the other words.

large plains
fishing boats
threshing machines
refrigerator cars
good harbors
petroleum
mountains
volcanoes
people
rivers
iron
coal
lakes
bays
factories
forests

3. Write a paragraph of five sentences telling about the rivers in Japan. In your first sentence tell where most of the rivers rise. In your second sentence describe the upper parts of the streams. In your third sentence tell whatever you wish. In your last two sentences describe the lower parts of the streams.



WIDE WORLD PHOTOS, INC.

Goods are shipped between countries by railroad and airplane, as well as by ship. But most world trade is carried on by means of ocean-going steamships like the one in this picture.

Trade Between Countries

All people, you know, obtain their food, clothing, and shelter from the earth. In different parts of the world people get these necessities in different ways. Very primitive people, with simple ways of living, make use only of materials supplied by the earth in the area in which they live. People who live in complex ways supply themselves with many things which they cannot produce with their own hands or even in their own lands. They obtain these things by trade, often with people who live in distant places.

Trade, as you have learned, is the business of buying things from the people who grow or make them, and selling them to the people who use them. Both men and countries trade with one another. This chapter tells about trading products between countries.

WHY NATIONS TRADE

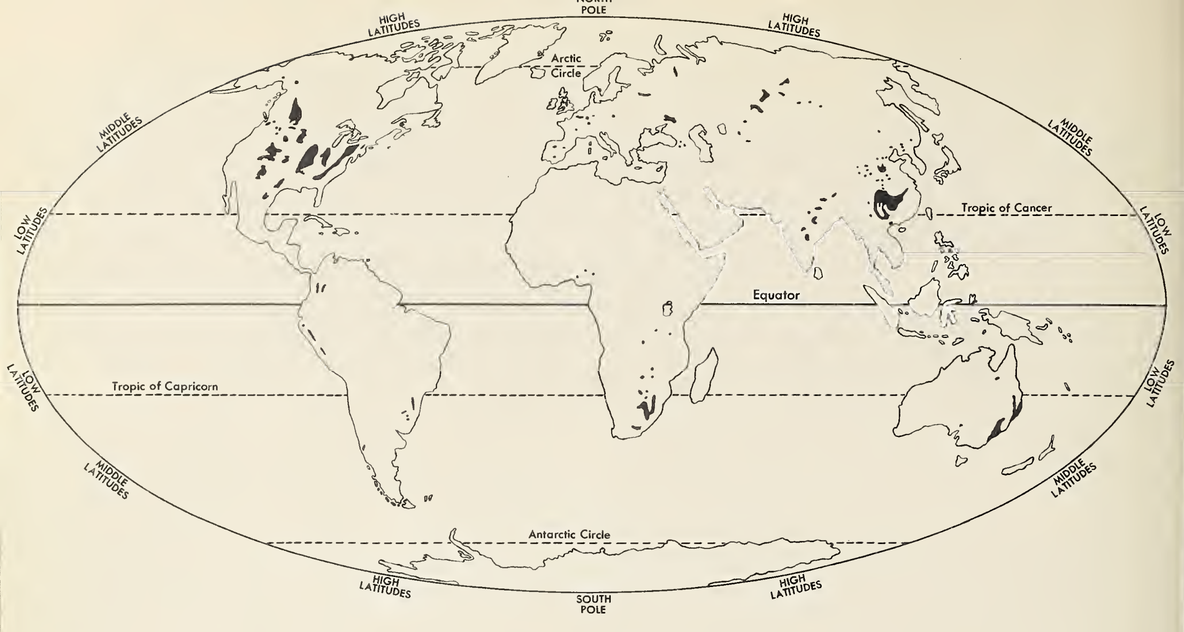
You have seen in the other parts of this book, especially in the chapters about China and Japan, why countries trade. By now you know that not all the regions over the world have the same natural resources. Some countries have a certain raw material that is not found in any other part of the world. Some countries have such good climate and soil for raising a particular crop that their farmers can grow it more cheaply than farmers can in other countries. Some countries have rich pasture lands which furnish good feed for herds of cattle, sheep, or other grazing animals. These countries often have surplus meat, hides, or wool. They exchange these for the products of farms or factories in other countries.

Different people have different skills. In some countries people have gained great skill in manufacturing certain articles such as the small, beautiful watches made in Switzerland. Skilled men work on a small amount of material. They do a great deal of careful work to make small products. Every year they produce thousands of fine watches more cheaply than can the people in other lands. Such countries often produce fewer raw materials than their people need. They may not be able to raise enough grain and other food crops to feed their people. They may not have enough coal or other minerals to meet their needs. It pays these countries, therefore, to trade with others that have a surplus of such products.

When a nation takes part in the world's trade, it supplies its people with many different things from foreign lands. Its people may have delicious foods, clothing made of many kinds of cloth or leather, and many different materials with which to build their houses. If crops in their land fail, they need not suffer famine. Food is brought in from other countries. If, however, anything happens to stop the transportation of goods, then the people may suffer. They may not have the food and clothing they need. In time of war a nation often cannot carry on its trade with other lands. It may not be able to sell to other nations articles that its people have made.

WORLD WIDE PHOTOS, INC.

How war prevents trade. In World War II thousands of merchant ships of many countries were sent to the bottom of the ocean.



COAL FIELDS OF THE WORLD

NATURAL RESOURCES AND TRADE

Coal. This book has explained to you that modern nations use enormous quantities of coal. Coal is mixed with iron ore and is then burned to melt the iron and separate it from the rock. Coal is used to heat the buildings of modern nations and run their factories and railroads. Coal, of course, is not used to run automobiles, trucks, and buses, but it is needed to make new ones when the old ones wear out. Industrial peoples, who use machines, depend on coal more than on any other single raw material.

This necessary fuel is not scattered evenly over the earth. If it were, each region would have its share of coal. Miners in any region could dig all the fuel from the earth that the people needed. Coal is not always found in the parts of a country where people need it most.

Notice on this map where the world's chief coal fields are. The United States has several large coal regions. These regions produce over nine tenths of the coal of North America. Canada also has coal regions, mainly in the western part of the country and on the far eastern Atlantic coast. Other parts of Canada have little or no coal. Eastern Asia also has many coal fields, most of them in China. Japan has very little coal.

Trade for coal. Because some nations, like Japan, need coal and do not have it, they trade their products for coal. Other nations trade because their coal is so hard to dig up that it is cheaper to buy coal from some other nation. Still other nations have coal of such a poor kind that it cannot be used in manufacturing or as a fuel for their trains or ships.

Of course, it is easiest to import any article from a short distance. Although good coal is mined in western Canada, some provinces of eastern Canada import their coal from neighboring places in the United States. These provinces lie nearer to the mines in eastern United States than to those in western Canada. It is therefore cheaper to transport the coal from eastern United States.

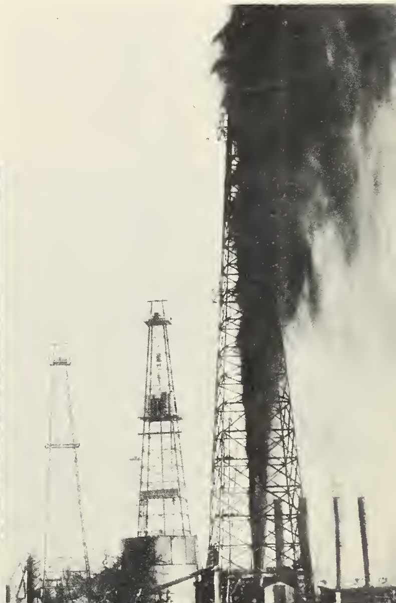
Petroleum. Another mineral that is becoming more and more important to industrial nations is petroleum. From petroleum we get fuel oil. Tremendous quantities of fuel oil are needed to run steamships and locomotives and factory machines. Oil is also used for heating buildings and for many other purposes. Also from petroleum comes the gasoline that drives our automobiles, trucks, and airplanes.

In a few places petroleum flows by itself to the surface of the earth. In most places it is so far below the surface that pipes are driven down into the earth to reach it. The petroleum is then pumped up into great tanks until it is needed. *Refineries*, or factories for making oil pure, then separate the different kinds of oil and gasoline.

Trade for petroleum. Some countries have much larger supplies of petroleum than others. The United States has more than any other country. This is fortunate, since the United States uses far more than any other country. Other great supplies of petroleum are in countries which have far less need of it. The inhabitants of these countries do not have many automobiles and therefore do not need gasoline to run them. Mexico is a country which has much petroleum. But in Mexico the number of automobiles is small for the number of people living there. Other countries which need much petroleum buy it from countries which produce more than they need.

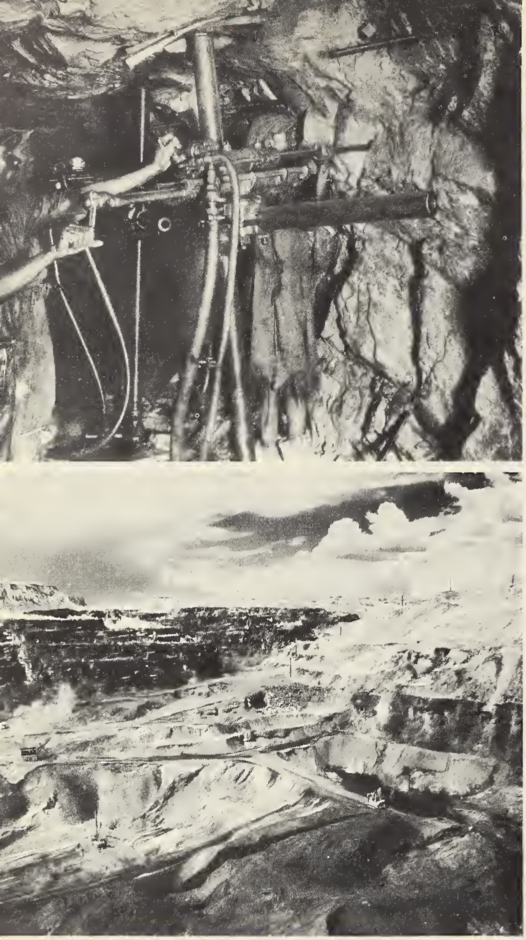
Precious metals. Other natural resources which are also found in some countries and not in others are precious metals such as gold and silver. People all over the world have always wanted these metals because they are shiny and can be used in making beautiful things. These metals are also useful for money. They are not only beautiful but scarce. Therefore they are expensive.

South Africa produces almost two fifths of all the world's gold. Russia, the United States, and Canada also mine gold, but



Coal and oil are very important natural resources. Most of the world's coal is mined in tunnels underground. On the right are three oil wells. When oil is first reached, it often gushes high into the air.

EWING GALLOWAY



EWING GALLOWAY, AND U. S. STEEL PHOTO FROM BLACK STAR

Two ways in which metals are mined. In Africa some gold is mined from underground tunnels. The lower picture shows a great open iron mine in the United States.

Stone, a valuble mineral resource, is mined from large open quarries like this one.

PHILIP GENDREAU, N. Y.

not so much as South Africa. Western Europe produces almost no gold at all.

Much more silver is found in the earth than gold. Therefore silver is less valuable than gold. North America supplies about two thirds of the world's silver. All the rest of the world put together does not produce as much silver as North America does.

Other minerals. Industrial countries must have these and many other minerals. They need stone for putting up big buildings. They need tin to mix with other metals. And they need small amounts of rare minerals which are used in making steel. If one country has large quantities of coal and another has large quantities of iron ore, the two countries may trade these products. Then each country can develop an iron and steel industry. No country has within its own borders every mineral it needs.

Different climates. It is a big jump from minerals to climate. But climate, too, helps to explain why the nations of the world trade with one another. You know that there are great differences in climate from country to country. For this reason the crops that can be grown in different countries are different. Manchuria, as you know, cannot grow cotton, but Egypt can.

Each crop that men raise has to have a certain amount of heat and moisture. The delicious bananas that we eat can be raised best in rainy tropical lands where there are no frosts. The banana plants must be planted in moist ground. They must have plenty of sunshine and warmth, or they do not produce fruit. They seldom produce fruit in the United States. Without trade, the people of the United States would never have eaten bananas.

Tea, you remember, is grown in parts of

China and Japan. It cannot be raised in Hokkaido, or in far northeast Asia where the Reindeer People live. People living in these regions could not have a cup of hot tea if they did not produce something else to trade for tea.

Wheat, which is ground into flour from which bread is made, grows best in partly arid lands in the middle latitudes. In North America, in Europe, and in Asia there are regions where this grain grows well. There is such a region in the wide plains of central Canada. Here the winters are long and cold. During the summer the sun shines three quarters of the time and warms the land. Wheat needs at least three months of weather without frost. Some kinds need more than three months.

Trade for farm products. People who live in the high latitudes or in the middle latitudes must obtain bananas, coffee, and other crops from the warmer lands where they are grown. These people may not be able to grow these crops at all, or they can grow them only at great expense. The people of the low latitudes and the lower middle latitudes have to trade to obtain the products of the cooler parts of the earth such as wheat and potatoes. Though the farmers could raise wheat successfully, other crops bring them more income. It is cheaper to obtain their wheat by trade. Of course you understand that if there are high mountains in a region, crops needing cool weather can often be grown there. They are raised on high slopes or plateaus or in high valleys, even in the low latitudes.

Trade for forest products. Climate makes a difference also in the natural vegetation of a region. Some parts of the tropics that have warm weather and plenty of rain at all seasons are covered

H. ARMSTRONG ROBERTS AND EWING GALLOWAY

Bananas can be produced only in the low latitudes where there is no frost. Most of the world's wheat is raised on the level or rolling grasslands of the middle latitudes.

Potatoes, chiefly a middle-latitude crop, can be grown even in the high latitudes.

EWING GALLOWAY

EWING GALLOWAY

Logging mahogany in the tropics. From these logs will come beautiful red-brown wood.

with rain forests. Many of the trees are hardwood trees that furnish wood used for making fine furniture. You have probably seen the beautiful wood called *mahogany*, which is used in making pianos. It is a hardwood that is reddish brown or brownish yellow in color. If people outside the tropics want mahogany, they must import it from the tropics.

In the higher middle latitudes the weather is very cold for much of the year. Mahogany trees cannot grow there, but there are many pines, spruce, firs, and other cone-bearing trees. From these forests comes a large part of the world's timber that is cut for lumber. Tropical forests furnish only a small part of such timber.

Some countries have a good climate for growing rich forests but have little or no wood today. They cleared away the forests to have land for crops and pastures. Usually, when land was cleared, most of the trees were burned to get them off the ground. The people did not plant new trees. Such a country may spend millions of dollars a year for wood, wood pulp, and paper products. Indeed it may spend even more for wood than it pays for imports of wheat and flour.

Trade for animal products. Some land, you know, is too arid for trees but not too arid for grass. Lands like these are often used for grazing. In some parts of the world grasslands are divided into large ranches where sheep or beef cattle are raised. Cattle need tall grass. Since a better income can be had from cattle than from sheep, cattle are usually raised on the rich prairies. But sheep can get along very well on short grass. Therefore they are raised on steppes, where the growth of grass is too scanty for cattle.

In the southeastern part of South America large numbers of sheep are raised for their wool. After each shearing time long lines of carts loaded with wool move slowly to the ports. The wool is sent to the markets of Europe and North America. In a hot climate sheep could not produce such thick coats of wool.

The soil and the surface of the land. It is easiest to grow most of the crops that we ourselves eat, or that we feed to animals, on land that is fairly level or gently sloping. The largest part of the farm land in the world is on the plains. The great fields of corn and wheat are in level or rolling places.

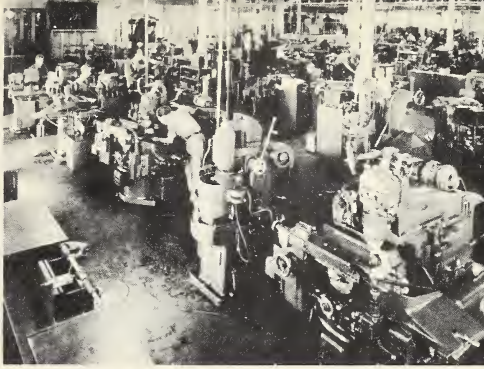
If you live in a farming region, you know how necessary it is to have fertile soil. Few useful plants will grow where the land is covered with stones. Most food crops grow best where the soil is not too sandy or too gravelly and has enough of the food that plants live on.

Delta lands usually have deep, rich soil. They are made of earth that has been carried downstream by the rivers. The soil of deltas contains plant food of many different kinds which the river has picked up from its whole basin.

In countries having large level fields with rich soil, the farmers often grow a large surplus. They often have wheat and other crops to sell in world trade.

PHILIP GENDREAU, N. Y.

In Switzerland skilled workers manufacture fine watches that are sold around the world.



PHILIP GENDREAU, N. Y.

In modern factories, machines like these cut and shape metal parts for other machines.

OTHER REASONS FOR TRADE

So far, you have read about the reasons for trade that have to do with the resources of a region. Next you will learn some reasons which have to do with the people living in the region.

Cost of labor. In some countries workers are paid much higher wages than in other countries. Suppose factory workers make suits of men's clothes for high wages. These suits must then be sold for a high price. The selling price of the product must cover the cost of the wages as well as of the raw materials. Japanese peasants, as you know, work for very little. They raise mulberry trees and do all the tiring work of feeding the silkworms for low pay. For this reason the silk exported by Japan can be sold at low prices.

Mulberry trees could be grown in certain parts of the United States. But it would not pay the farmer to raise them, because he would have to pay high wages for labor. Laborers in the United States are paid higher wages than laborers in Japan. It is cheaper for the United States to obtain its silk by trade than to produce the silk it needs.

Skill of the people. People who live in simple ways have little to trade because they do not produce large quantities of goods. In countries where people live in primitive ways each family does nearly all its work for itself.

People who live in complex ways have learned to divide their work so that each person does only a small part. He learns to do this part well and very fast. The man or woman who runs the loom in a cotton mill can make the machinery produce hundreds and hundreds of yards of fine cloth in a short time. The machine saves much hard labor. All that the worker needs to do is to make the machine go and to guide its work. It is easy and quick and cheap to make articles in a factory. Such a large number of articles is made in a short time that the workers produce more than they themselves can use. The articles are sold to other people. The workers receive money for their work, and with the money they buy the things they need to live.

Use of machines. When machines are used, one person alone can do a tremendous amount of work. He can earn more money than if he tried to do the same work by hand. So he has more money to spend for goods made by others.

PHOTO FROM EUROPEAN

These two Eskimos are bartering skins of animals for products of far southern lands.

PHOTO FROM EUROPEAN

This Navajo silversmith sells a necklace for money. He will buy goods from other regions.

In industrial countries more kinds of machines than you can imagine work for the people. Machines grind flour. They press juice out of sugar cane. They cut up meat, make sheets, put parts of other machines together, wash and iron clothes, and do many other things. New machines are being invented every day.

People with the skill to make and use machines usually have large surpluses of manufactured goods. They may have automobiles and steel rails and farm machinery to sell to other countries. They export these things. Their people have money with which to buy articles from other industrial and farming countries. Industrial countries usually trade with other industrial countries. There are a few industrial countries which trade with almost every other country in the world.

Dense population. On the population map on page 116 see how the people are scattered over the world. In some countries like China and Japan every bit of good land is crowded with people trying to make a living. All the raw materials of the region are hardly enough to go around among so many people. The only thing that such a nation really has for trade is the labor of its many people. Japan is one country that tries to sell this labor. It imports raw materials, has its thousands of workers manufacture these materials into useful articles, and then sells the articles. This is perhaps the only way that a densely populated country with few natural resources can have a part in the world's trade and supply a good living for its people. Regions of dense population cannot carry on great trade unless they can sell the labor of their many people.

Thin population. Other regions with fewer people have more resources for each person. Some regions rich in natural resources are not crowded at all. Therefore they have more products to sell and more money with which to buy. Workers are able to produce more food and raw materials than they need. These people can exchange their products for the articles manufactured in the crowded regions. On the large, partly arid plains of Manchuria the population is not dense. Each farmer grows more wheat than he needs and exports the surplus. Manchuria also exports coal and other minerals to foreign countries.

PACE FROM MONKMEYER

This bale of cotton may be sent to Japan or China, where it will be made into textiles.

RALPH CRANE FROM BLACK STAR

Fish landed in one country may be canned and shipped to the other side of the world.

Regions of thin population have their trade problems, too. The land itself may be rich, but there may not be enough workers to obtain the resources. A region may have plenty of fine forests but few or no men to cut down the trees. Brazil, the largest country in South America, has large forests. It could sell a great deal of lumber to the people of Brazil and other countries. But it lacks workers to cut down the trees and transport the lumber to markets. It could use the work of thousands of settlers from other lands in cutting and transporting forest products.

Rich and poor regions. Almost every land has advantages for producing at least one thing. It pays the people living there to produce a surplus of that thing. Then they can trade the surplus for things that can be obtained cheaply in other places. You know that Manchuria exports great quantities of soybeans.

Some regions, however, are very poor. They have nothing that anyone else would want. The Eskimos of North Greenland have only a few products for trade, such as furs and ivory from walrus tusks. These products, however, sell at good prices to people who live in other countries. The Canoe People of Tierra del Fuego have nothing at all to sell.

Other countries like the United States have many products to exchange in world trade. These products,come from mines, ranches, farms, forests, and factories. The people have large surpluses to export, and therefore they have income with which to buy goods in the world's markets.

Judging a country's trade. You should now be able to tell much about a country's trade from what you read about its people and its resources. You can judge how much trade it will have and sometimes the products it will trade. Think of these questions about each country you study:

1. Is the number of people in the region about right for its natural resources?
2. Does it have mineral resources?
3. Are the climate, the soil, and the surface of the land good for raising crops needed in other parts of the world?
4. Are there forests for timber or good grasslands for raising animals?
5. Are the people skillful in manufacturing?
6. Can they afford to sell their products cheaply enough to have buyers?
7. Do they have good transportation?

Transportation at the time of Marco Polo. Luxury goods were transported by camel caravan across Asia. Ships like this one took the goods across the Mediterranean to western Europe.

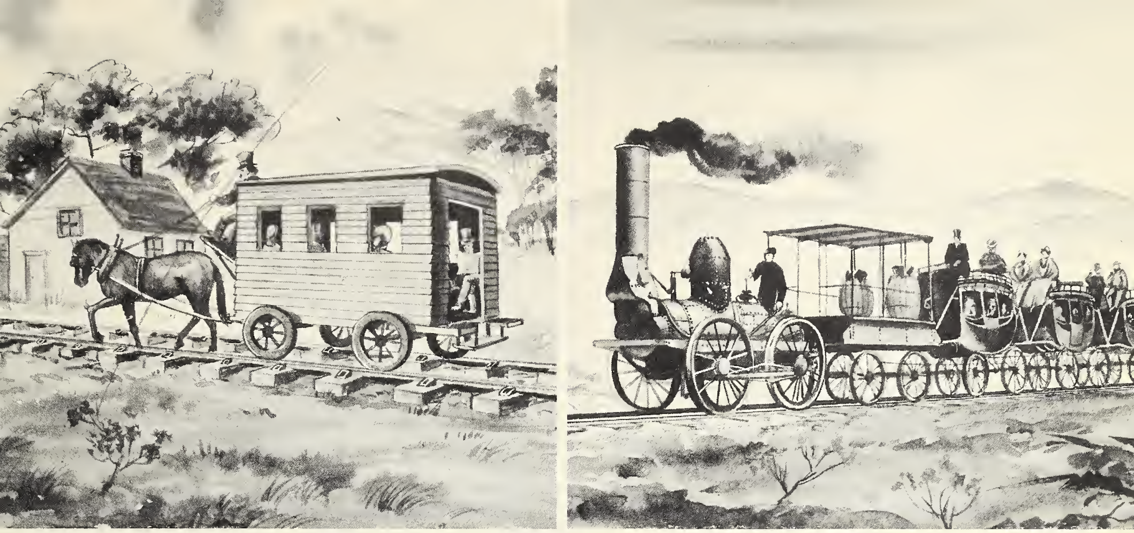
TRANSPORTATION NECESSARY FOR TRADE

A nation needs cheap and rapid means of transportation if it wants to carry on much trade. Goods that are traded have to be transported from the place where they are produced to the place where they are used. A farmer who sells his crops at a roadside stand takes them only a short distance. Goods that are bought and sold in foreign trade, however, are often carried long distances over the great ocean routes that you have seen on the map on page 207. Some goods, of course, are taken to market in railroad cars or trucks. If the goods are light in weight or valuable, or if they will spoil easily, they may be transported in airplanes.

Today an important trading center such as New York City sends and receives goods by land, sea, and air. Transportation is quite different from what it was in olden times.

Early transportation. Until the first steamboats and railroads were built, transportation was slow and expensive. On land, loads were carried or pulled by animals, perhaps horses or oxen. On water, sailing vessels transported people and goods. Such vessels moved slowly across the ocean and along the coast from one city to another. They had to depend on the wind, which sometimes blows too hard and sometimes not hard enough. Long ago sailors learned how to make the wind take them in the direction they wanted to go. They feared only hard storms or a dead calm.

With slow means of transportation men could not make money if they sent goods of low value to foreign lands. The journeys were too long and costly. Ships might be lost or captured by an enemy. The seller could make money only by trading what we call *luxuries* or luxury goods. They are things like perfumes, silks, ivory, spices, and precious stones that people wish for but cannot easily get. Such articles do not take up much space, but they bring high enough prices so that the merchant makes a lot of money



The first railroads were horse cars drawn on wooden rails. On the right is one of the earliest steam locomotives. Compare it with the modern steam locomotive on page 275.

if his ship gets home safely. Of course, in the early days only rich people could purchase articles brought from distant lands. For example, poor people in Europe could not afford to buy silk which came from China.

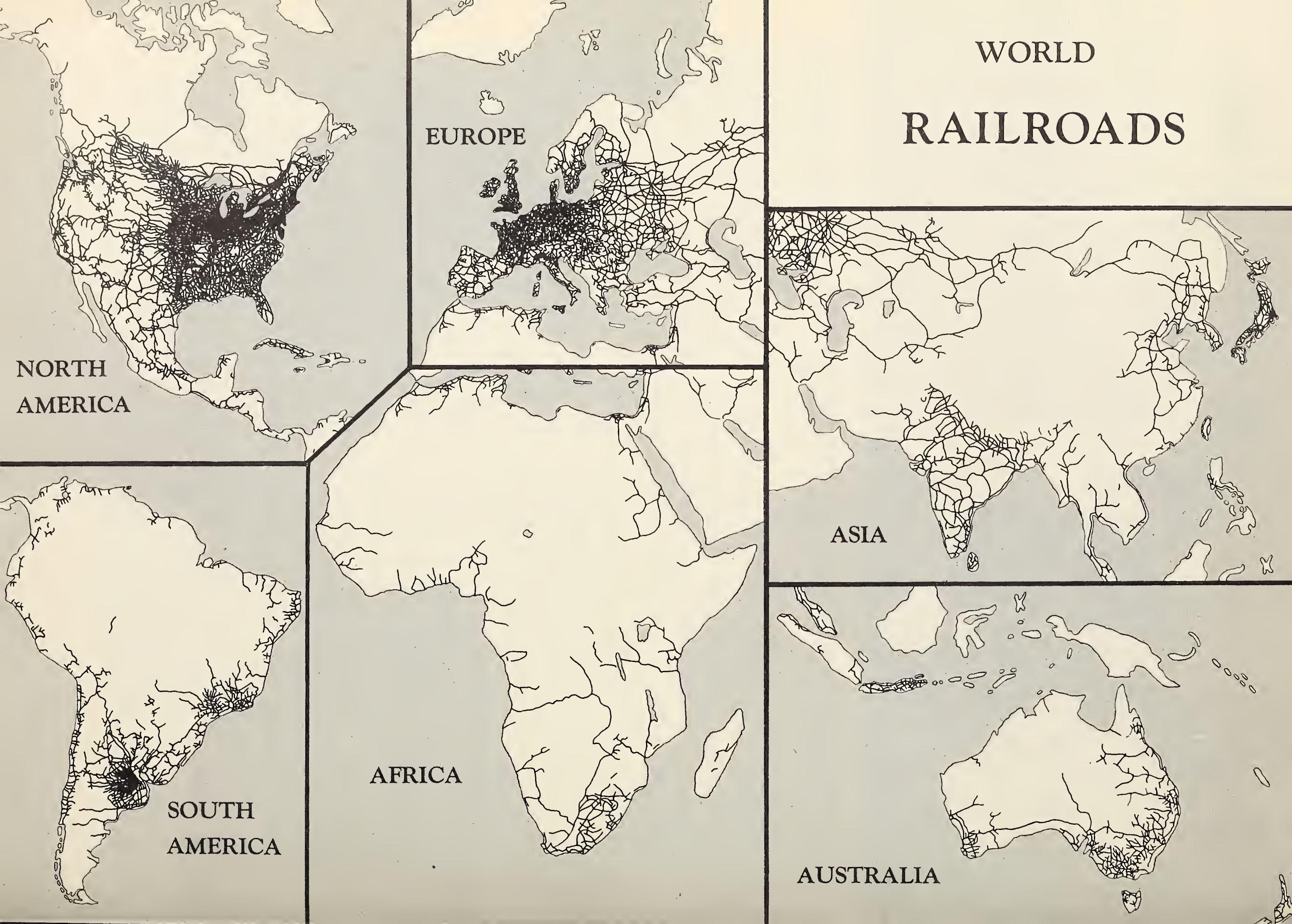
People of the world have always needed grain. But bags of wheat are large and heavy and each bag is not very valuable. Before the use of modern means of transportation, wheat could be carried overland only short distances. Transportation by wagon was too slow and expensive to carry grain all the way across a continent. If the wheat fields were close to a navigable river, the grain might be sent to a town or village that could be reached by boat. Most people, however, depended on grain raised in near-by fields.

The invention of railroads. Then, about one hundred fifty years ago, a new and very important means of transportation was invented, the railroad. You have read about the steam engine. You know that the part of the engine which the steam moves can be made to turn wheels. At first men used the steam engine only to turn wheels in factories. Then a man decided to put a steam engine on a wagon bed and make the engine turn the wheels of the wagon.

If you put a steam engine on wheels and make it turn the wheels, you have a locomotive. The steam engine takes up nearly all the space there is on a locomotive. So you cannot make the locomotive itself carry enough passengers or freight to pay for the cost of the trip. But the locomotive can pull many cars if they are hitched to it. And cars run smoothly on tracks, even around curves.

The first railroad cars were small and uncomfortable for passengers. But later the cars were greatly improved and made larger. Today our best passenger trains are streamlined for great speed and comfort. What great differences railroads have made in the transportation of goods! Before you read further, think of some of these differences. Then see whether the ones you have thought of are the ones described here.

WORLD RAILROADS



Railroads today. Railroads can be built easily on dry, level land and even in hilly regions. It is much more difficult to build them on steep slopes. Gently sloping roads, on which to lay the rails, have to be cut into the mountainsides. If this is not done, the cost of pulling cars up the steep slope makes transportation very expensive.

This map is made up of six parts which show most of the land area of the world. The black lines stand for the railroads of each continent and island. Where is this map blackest with lines? You can see at once that not all parts of the world have good railroad transportation. In Greenland where the Eskimos live there are no railroads at all.

In the United States only a few regions are distant from a railroad line. Many of the railroads are located in the eastern and central sections of the United States. Most of the people of North America live here. This area has large amounts of minerals. You remember that the chief coal fields of the continent are located in this region. Here also are many of the most important industries, as well as rich farming lands.

Where else on the world map do you see many railroad lines? The railroads of western Europe pass through a region of many people. This part of the world, too, has large coal fields and other mineral resources. It has good farm lands and is a great factory region. The land is made up mostly of plains, hills, and low mountains. But a few railroads have been built even through the high mountains.

Japan, you know, has a dense population and many industries. Yet you can see from this map that Japan has fewer railroads than Europe and the United States. The hills and mountains between the small coastal plains make railroad building hard. Besides, the good farming regions are near the coasts, and they use ocean transportation.

Transporting grain by railroad. The building of railroads has made a great difference in trade. Products of all kinds, even those that are not luxuries, can be transported cheaply and sold in distant places. Bulky products, those which are heavy for their value such as wheat, are no longer carried by boat only. In countries having many railroads wheat is raised in areas where the soil and climate are especially good for this crop and where it can be produced at low cost. Often huge quantities of wheat are carried in large trucks to a near-by railroad. Here the grain is loaded into railroad cars. These may transport it all the way across the continent. Many people can afford to eat wheat bread because it is not so expensive as in early times.

Railroad transportation is especially cheap where there are heavy loads going in both directions.

Transporting livestock by railroad. Even livestock is transported to market in railroad cars. The cars may be unloaded several times during a long trip, and the animals fed and watered. The cars are switched to sidetracks at a station where big pens have been built beside the tracks. The pens are large enough so that the animals can walk about before they are loaded into the cars again. In hot weather there are sprinklers that can be turned on to cool the animals. On hot days it is a common sight at the pens to see great numbers of black and brown hogs that have been fattened for market getting shower baths.

Railroads help in preventing famines. The countries that have many rail-

EWING GALLOWAY

These fine hogs are fed before being shipped. The man is giving them a cooling shower.

EWING GALLOWAY

Trucking across one of our western deserts. Trucks haul heavy loads hundreds of miles.

roads are not likely to have famines. If the crops in one region fail, food is quickly moved to that region from other parts of the country. But China, which still has few railroads, has famines. Farming families in North China may suffer for lack of food during a very dry season or a flood. At the same time there may be plenty of rice or wheat in South China. But there is no quick transportation to carry the grain northward.

Highways. Although there are many railroads in the United States, they cannot carry all the goods to the places where they are used. Goods must be carried to the railroad and from the railroad. They must also be carried in many places where there are no railroads.

So the United States and the other industrial countries have wide hard roads for fast automobiles and trucks. Such roads connect all the large cities. In parts of the country where there are many large cities, these paved highways run in all directions. They cross other roads often. So a highway map of the country would have more black lines than the railroad map on page 265. On these highways many large trucks carry freight between cities.

Many other roads joining farms with near-by markets are not so good as the main highways. However, only light cars, not heavy trucks, need to travel on them.

Most kinds of goods carried by trucks move short distances, either to markets or to railroad stations. Over long distances heavy articles or large quantities of goods can be transported more rapidly and cheaply by railroad than they can be carried by truck.

Waterways. Even after good roads and railways were made, people continued to transport freight by water. You know that there is a great deal more water than land on the surface of the earth. The ocean is a vast body of water. It makes a good highway because ships can travel on it in all directions. Both large and small ships can move on the ocean. No season of the year finds the main water routes frozen over.

A. F. SOZIO FROM GENDREAU

On large lakes between the United States and Canada, lake steamers carry great quantities of freight. But every winter, ice keeps them tied to the dock for a few months waiting for spring.

Navigable rivers, such as the Yangtze, have also been used for transportation since very early times. However, in parts of the world that have severe winters, traffic on the rivers is stopped because of ice. On many rivers high water may at times make travel dangerous. At other times low water may make it impossible for large boats to travel on the stream. Other rivers cannot be used because they flow mile after mile through swampy country without landing places.

Large lakes are also very good waterways. Boats can travel on them in many directions. But in a cold winter freshwater lakes usually freeze over as rivers do. Then they are not navigable again until spring.

Canals. Large canals built to join bodies of water are very important to trade. Let us see what difference such canals make. Before the Suez Canal was dug, cargo sent by ship from the Red Sea to the Mediterranean had to go around Africa. Otherwise it had to be unloaded and transported over land to reach the Mediterranean Sea. There it had to be loaded again into another ship. All this work with cargo was expensive because it took so many laborers. It was also slow. Since the Suez Canal has joined one ocean with another, the work of unloading and loading again does not have to be done. Traveling through the canal is less costly than shipping the cargo across the isthmus by train. But only a few canals are as wide and deep as the Suez Canal. Only a few can be used by large modern ships.

As you know, China uses many rivers and canals for nearly all trade over long distances. The most important river highway is the Yangtze. The Yellow River also carries much trade. The Grand Canal and many smaller canals provide highways for small boats. But mostly they are old-fashioned boats driven by wind or pulled by men who walk along the banks.

Sometimes these small waterways fill up with silt brought down by the rivers that flow into the canals. Then men must

EWING GALLOWAY

In sailing ships like this one, American traders sailed around the world. They brought back tea, spices, silk, and pottery from oriental countries.

dig out the sand or soil before boats can be used again. It takes a great deal of time and labor to deepen the canal. The work must be done by hand. It costs too much to buy machinery to dredge shallow streams.

Water transportation in early times. Many kinds of boats travel on the waterways of the world. You know that Columbus and his men discovered America by crossing the wide Atlantic in small sailing ships. You know, too, that Magellan's men sailed all the way around the world for the first time more than four hundred years ago, taking three years to make the trip. If men had not learned how to build and sail ships, we would have learned very little about this world of ours. Without ships people could sell only a few of their products to people who live across the ocean. Bulky things like wheat or beef are not shipped by airplanes unless the need is great.

Early sailing ships. On page 262 you saw a picture of a ship of olden times. People who traveled on the water in rowboats found that the wind often blew so hard that it pushed their boats through the water. They fastened poles to a strong upright mast. Then they stretched cloth sails between the poles. The masts were made as high, and the sails as large, as the boat could carry without tipping over. Even a gentle wind, striking the sails, would move a heavy ship. The sailors steered these sailing vessels by a *rudder* fastened to the stern.

For thousands of years sailing vessels carried people and goods across the ocean. They also carried loads along the coast from one city to another. In such vessels men sailed along the coasts of the continents and learned their shapes and sizes. A few sailing vessels of a kind called *schooners* still carry some kinds of freight such as lumber along the Atlantic and Pacific coasts of the United States. But sailing vessels are slow. Today much freight and many passengers are carried by a faster and surer kind of ship, the steamship.

Early steamboats. You know that coal is used to run a steam engine and that steam engines are made to turn the wheels of factories. You have learned how men put steam engines on wheels and made locomotives to haul trains of cars on land. At about the same time Robert Fulton, an American, first put a steam engine in a boat and made it move the boat. Many of our boats nowadays are steamboats.

The first steamboats had *paddle wheels* on each side. These looked much like the water wheel that used to turn the miller's machinery. But the steamboat's machinery turned the paddle wheels instead. Each paddle of the wheel pushed back against the water like an oar. Some steamboats that travel on rivers today have one wide paddle wheel at the stern.

River steamboats carry heavy loads more cheaply than railroads can. Therefore they are still used on many rivers such as the Mississippi River, even though they travel more slowly than trains. River steamboats are also very useful in lands where there are few people and few railroads or highways.

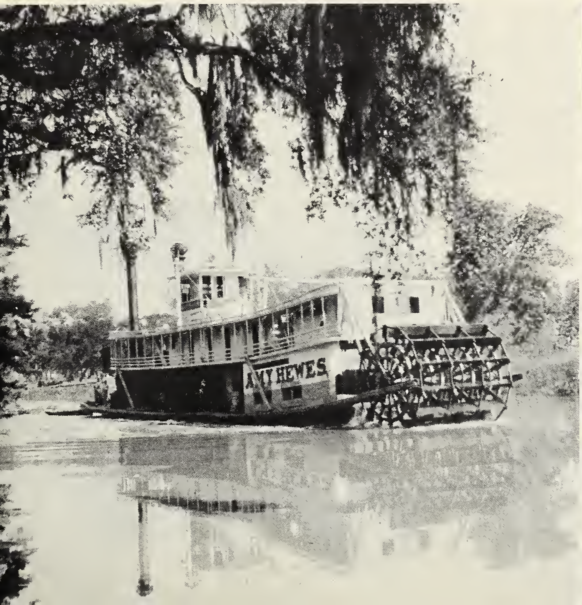
Modern steamships. Steamships that travel on the ocean and on large lakes usually have *propellers* instead of paddle wheels. A propeller is shaped like an electric fan. It is placed at the stern of the ship under water. The ship's engines turn the propeller, and it then drives the ship through the water. When the propeller turns in the opposite direction, the ship goes backward. Some boats have only one propeller. Others have two. Still others have three or even four.

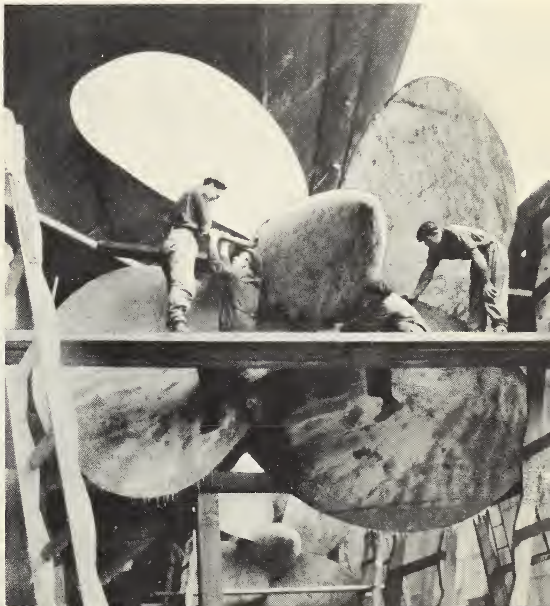
In many ocean steamships, coal is burned to make the steam engines go. But today the largest ships burn oil instead. All nations which carry on much ocean trade are building ships of this kind, especially for carrying cargo. Oil can be stored in less space than coal. This means the ship can carry more cargo. Fewer men are needed in the engine room of an oil-burning ship. Also it is much easier and cleaner work looking after an oil-burner than shoveling coal in a hot, grimy boiler room.

Large modern ships are enormous vessels made chiefly of iron and steel. They are stronger than wooden ships and they last longer. They can carry loads much heavier than their own weight. They carry thousands of people or many carloads of freight. They travel night and day across the ocean. They move almost as surely and safely in bad weather as in good.

Some steamers like the one on the left are still used on rivers and other shallow waters. But most lake and ocean steamers are now driven by propellors like the one on the right.

EWING GALLOWAY





Ocean transportation. Transportation by boat is much cheaper than by railroad. In the United States it is cheaper to import raw materials from halfway around the world than to ship them by railroad across the country.

The Atlantic Ocean, you remember, between northeastern United States and Europe has the greatest ocean trade route in the world. This route joins regions of dense population which have many products to sell. The trade is in food, raw materials, and manufactured goods.

Large trading ships need deep water in the harbors or ports where they land their cargoes. Some nations have harbors that are wide and deep, but other nations have had to build ports.

Good harbors are a great advantage for trade. Ships can move up to the wharves and unload their cargo. If a harbor has shallow water, ships have to anchor out in the deep water. There they unload their cargo into smaller boats. At the wharves these small boats unload the cargo again. It is expensive to load and unload a ship's cargo.

Airplanes and air routes. We would expect that travel by air would have more transportation routes than travel by land or water. But planes need landing places where they can stop for fuel or repairs. Also there must be many landing fields which the planes can use in case of bad weather or accident. Therefore several regular air lines move their planes over the same routes. Most of these airplane routes lie between the large cities of the world.

The shortest routes between some of the large cities of the world would be over the regions around the north pole. But these regions are covered with snow or ice during a large part of the year. You have already learned that few people live north of the Arctic Circle. It is very hard for men to make and keep up landing places for planes in the polar regions. Therefore airplanes usually follow those routes where landing places have been built.

Air transportation. From great airports modern planes take off to cross either the land or water separating one

This airplane has brought a cargo of bananas from Central America to the United States. The empty airplane is now being loaded with a cargo of new American tractors for the return trip.

MONKMEYER

The shoes you wear are made from raw materials which have been brought to the United States from all parts of the world.

CONRIED FROM MONKMEYER

nation from another. They fly so fast that passengers can travel to other lands much more quickly than ever before. Freight, if not too bulky, can be transported rapidly. Even bulky cargo may be carried if it is badly needed in some other part of the world.

Many passengers and large amounts of mail and express are transported by air. Planes carry machines to mines or factories when it would take too long to send the machines by railroad or ship. Often planes have taken such machines to places that railroads or ships or even trucks could not reach. Over very long distances planes are being used more and more to transport certain kinds of goods which spoil easily.

Raw materials from all the earth. Today, with rapid means of transportation for all kinds of goods, industrial countries obtain raw materials for their factories from almost every country in the world. They buy and use the products of dry lands and moist lands, hot lands and cold lands, lands near by and lands far away.

THE SHOES YOU WEAR

Raw materials in a pair of shoes. Let us take a common article and see from what different lands the raw materials in it probably came. Think of a pair of shoes.

In the United States a great many factories make nothing but shoes. These factories are in cities where there are plenty of people to run the machinery. It is easy to ship hides and leather to cities.

Even though the United States has a large supply of cattle hides, it also imports some for the making of shoe leather. Perhaps you have looked at ladies' shoes in store windows. Many kinds of leather are used to make shoes for different purposes. There are walking shoes made from skins of many different animals. There are ski boots made of cowhide to keep out water and snow. There are thin kid slippers for dancing and sheepskin slippers with the wool left on for bedroom wear.

Where the skins come from. Calf

EWING GALLOWAY

Making leather. The first picture shows raw hides going into the tannery. After being tanned and dyed, the hides are stretched on racks to dry as in the second picture.

skins are obtained from Canada, Australia, New Zealand (southeast of Australia), and countries in South America and Africa. Horse skins also come from some of these lands. Skins of lizards and alligators are obtained mostly from India and countries in South America. Sheep and lamb skins are brought from India, Australia, New Zealand, and countries in South America and Africa. Goat, kid, ostrich, and kangaroo skins also are brought from distant lands. Then they are made into leather for shoes.

How leather is made. Leather is made from the skins of cattle or other animals. This is how it is done. Hides from distant countries are first transported to the United States in ships. Other hides are carried in railroad cars from packing houses, where the animals are slaughtered, to *tanneries*. A tannery is a factory where leather is produced from skins of animals.

The hair is taken off by soaking the skins in a strong liquid. Then another strong liquid is used to make the skins tough. Next the skins are dried, smoothed, and given a color such as tan or black. Now they are ready to be made into shoes.

The liquids used in the tannery are mixtures of different raw materials. Like hides many of these materials are imported. One material comes from China, another from Italy, and still others from countries as far away as these.

Other materials in shoes. If you will look at a shoe, you will see that the leather is sewed with strong thread. Linen thread is imported from Canada or Europe or Great Britain. Cotton for most shoe laces and cloth for linings are produced in the United States.

Rubber for soles and heels may come from far eastern lands. Find Malaya, south of Indo-China, on your globe. This is one of the lands where rubber trees grow.

Thick tough leather, which is also used for soles, is made in the United States. In making the soles of some kinds of shoes cork is also used. Cork is imported from countries in Europe and Africa.

The nails in shoes are made of steel produced in the United States. But one of the metals needed in making this steel is imported from a great distance.

The silk in fine shoe laces, you know, is from Japan or China or perhaps Italy. In very dressy shoes even the upper parts may be made of glistening silk.

EWING GALLOWAY, PHILIP GENDREAU, AND EWING GALLOWAY

In these three pictures we see people loading rubber in Malaya, hauling cork in Spain, and hunting alligators at night with flashlight and rifle. Alligator leather is used for shoes and fine leather goods.

Our shoes get harder wear than almost any other garment. Millions of pairs are made in factories. The raw materials used come from all over the world. A great many people in distant lands work to produce all these different raw materials.

Harvesting cork. Cork is the outer layer of bark on the *cork oak*, a small evergreen tree growing in Spain and Portugal. With a hatchet a man makes a cut around the bottom of the tree trunk and another at the top of the trunk just below the branches. Then he makes several other cuts going up and down the trunk. Taking great care not to injure the inner bark of the tree, he pries up the curving outer bark with the handle of his hatchet. The big pieces of bark are shipped to the United States and other countries.

Hunting alligators. In tropical South America men go out on the streams in boats, searching for alligators. These dark gray or black animals are found on the banks of rivers, lying in the heat of the sun or perhaps floating near the surface of streams, with only their noses out of the water. The alligator hunter kills the alligators for their hides. Sometimes young alligators are captured and raised on alligator farms. To capture a young alligator, the hunters throw a very strong light in the animal's eyes. The light blinds the alligator for a few moments. Then the hunters thrust out a long pole with a hook at the end. When the alligator snaps its jaws over the hook, the hunters pull the animal into the boat and tie it fast.

In other lands also people labor to produce materials for shoe factories. Natives of South America who eat the meat of huge tree lizards have learned to save the lizard skins. They take the skins to market and sell them to men who ship the skins to the United States. Farmers in Canada cut and thresh flax. From fiber in the stalks of flax is made linen thread for sewing leather and cloth for shoe linings. And there are many other workers too who make materials used in our shoes.

THE NEED FOR WORLD TRADE

Trade and way of living. On page 18 you read that the Canoe People of Tierra del Fuego do not trade at all. On page 40 you learned that the Eskimos trade a little with white people and exchange their furs for rifles and other articles they need. You have also read that the Reindeer People of far northeast Asia trade with the Sea People. They obtain from the Sea People the meat and skins of seals in return for reindeer skins. The Reindeer People also trade to get tea which is raised by people in distant lands. Tea is important in the trade between the Reindeer People and merchants who travel to their part of the country. You learned, too, that the Navajos take their products to trading posts and exchange them for many different things made in the United States or even brought from other countries. And the Forest Indians of the Amazon offer food or forest products to a trader in return for machetes and other things which he has for sale. These primitive peoples do not use money in trade. You know that such simple trade, without the use of money, is called barter.

In Egypt the farmers sell cotton or other crops for money and use the money to buy tools and other needed articles. Money can be carried around easily and counted easily. In countries where people live in complex ways, everybody buys and sells things for money. Many people who do not make things sell their hours of work. They use the money that they get to buy the things they want and need. Thus they obtain by trade useful things which they are not able to produce themselves.

You have also read of the great port cities in China from which goods are shipped away to be sold to the people of other countries. You saw that work is often done to the raw materials that go through these ports, and that factory work and trade bring people to a port city. The work of importing and exporting goods provide important occupations for many people. When a country such as China trades with many others, we have complex trade, not simple barter.

In reading about Japan you learned that it also carries on world trade. It buys many of the raw materials it needs from other countries. In return, it sells to those countries many of the things that its people make out of these raw materials. We say that Japan sells the work of its people.

Industry and trade. The raw materials to make articles that we use daily come from many parts of the world and are produced by many different workers. Other people work with these raw materials to produce the articles we

UNION PACIFIC RAILROAD PHOTO

A giant steam locomotive. Railroads transport products to and from seaports and overland between countries. Without railroads world trade would be much smaller than it is.

buy in stores. Today different industrial regions are producing special things and then exchanging these for special things produced in other regions. Each industrial region produces the things which it can make best. It depends on transportation to bring it raw materials. It also depends on transportation to carry its products to near and distant markets.

If a country imports and exports many different products, we usually find that the people have a comfortable way of living. They have much more than just the necessities of life. Because they produce articles to sell, they have money to buy products of other countries. Trade makes it possible for nations to get materials for food, clothing, and shelter from the whole world. Therefore nations that trade the most are least likely to suffer from famines, floods, and other disasters.

But these countries suffer whenever anything happens to keep them from trading. Maybe it is a war which keeps them from trading with other countries. Then the people have a hard time, even though the war is not fought in their country.

Better living through trade. In countries that trade much with other countries people are able to get a better living. The nations of the world must, therefore, learn how to work together. If they are to sell the things they produce, they must buy the things that other people produce. Every nation must be willing to depend on other countries for natural resources and products it does not have. Without trade there is no way for all the people of every nation to get a good living.

Our earth can provide food, clothing, and shelter for everyone. But only through trade can all the people on our earth be free from hardship and famine.

Using What You Have Learned

Make a list — it will be a long one — of everything in your schoolroom that was brought there from some place outside your town or city. (Clues: Does your town or city make blackboards? Does it have forests? Does it make cement? Does it have rubber trees for your erasers?)

TO TALK ABOUT IN CLASS

1. What were the only kinds of goods traded in olden times?
2. What kinds are traded today?
3. Why do modern nations trade material, such as wheat and coal, which is bulky for its value? You remember that people of early times seldom traded such articles.
4. Over what kinds of land is it easiest to build railroads? How easy is it to build railroads where you live?
5. Name one primitive people who carry on little or no trade and give a few reasons why these people are self-sufficient. Name a great trading country and give several reasons why it imports and exports large quantities of goods.
6. Describe the kinds of countries that carry on a great deal of trade.
7. Why do nations trade with each other?

CAN YOU COMPARE?

Study the map of South America on page 264. Compare it with the map of North America on the same page. Where in South America do you think the most people live? Why? Where in North America? What other map in this book will tell you whether you are right? Find China on both maps. China has many people but few railroads. What does this tell you about transportation in China? About the way of living in China?

WORKING WITH MAPS

1. Locate and name the one great industrial area of the Orient.
2. On your globe show the shortest route between our western coast and Yokohama. (Clue: Use a piece of string.) Notice where this route lies.

TRANSPORTATION

If we did not have many ways of transportation, the people in towns and cities could not eat. Why not? Make a list of all the ways of transportation you have actually seen. (Clues: Look on pages 247, 266, 267, and 270.) Now make a second list of every kind you have used. (Clue: Start with a baby carriage!)

TRADE MAPS

1. Get a shoe and place it before a map of the world. Then by means of colored strings show where each part of the shoe came from. You may not be able to see the cork in the sole of your shoe, but if you can, to where on the map will its string lead? (Clue: See page 273.)
2. Make a list of things our country imports in order to build automobiles. Then make another trading map. This time get a big picture of an automobile and show where its raw materials came from.

CLIMATE AND TRADE

Suppose that all the world had exactly the same climate that your town or city has! What that you now wear or use or eat would you have to do without? (Clues: If you live in a northern state, could you have oranges? If you live in a southern state, could you have salmon or cranberries?) Be sure you understand pages 256–258. Then write a page story on why different climates help to make the world more interesting.

WORDS TO EXPLAIN ORALLY

1. What is meant by *goods?* By *freight?*
2. What is the difference between *domestic trade* and *foreign trade?*
3. What is a *locomotive?* A *highway?* Why are our highways being improved?
4. What work goes on in a *tannery?*
5. Describe the *propeller* of an airplane. Of a steamship.
6. Tell why sailboats need *rudders,* while rowboats do not.
7. Why are *steamships* more useful than *sailing vessels?*
8. Explain: *oil refinery; bulky goods.*

WHAT HAVE YOU TO TRADE?

Study pages 259–260 carefully. Explain what this sentence means: "The only thing that such a nation really has for trade is the labor of its many people." Have you ever traded your labor? (Clues: Do you wash the dishes? Mow the lawn?) What will you have to trade when you are grown up? Could you earn a living without trading something?

WRITING WHAT YOU HAVE LEARNED

1. Write the names of three luxuries named in this chapter. Write the names of three others not mentioned here.
2. Find pictures in this book of many kinds of boats and ships. You should be able to find: kayak, dugout canoe, steamship, warship, junk, sampan, rowboat, sailing ship, river steamer.
3. Copy on your paper these means of transportation: steamships, railways, airplanes. Write "C" after the cheapest way of carrying freight, "E" after the most expensive, "F" after the fastest, "S" after the slowest, and "L" after the one that moves the heaviest loads.

HOW PEOPLE TRADE

Draw a chart like this, but leave more space for filling it in. For some people you will need to write a number of things; so give yourself enough space.

People	*Simple or Complex*	*Things They Trade to Other People*	*Kinds of Transportation*
Canoe People	Simple	Nothing	Canoes
Eskimos			
Reindeer People			
Navajos			
Forest Indians			
Chinese			
Japanese			

Index

You will want to use this index often. It will help you to find information you may need to know. Find in this index the word **farming.** Below **farming** you see: in China, 151, 153, 154, 187, 196. This means that these pages tell about farming in China. A little farther down you see: in the Nile Valley, 89–94, 97–99. This means that on all the pages from 89 to 94 and from 97 to 99 you can read about farming in Egypt. On what pages can you read about farming in Japan? In two different places in this index you can find the numbers of the pages telling about climate in Japan. Find the two places. Notice that they give you the same page numbers.

This index also tells you how to pronounce many of the words you find in this book. These hard words are divided and spelled the way they should be pronounced. The marks on the letters in the following list stand for different sounds. The words in the list tell you the sounds meant by the different marks. Study this list. When you know what sounds the different marks stand for, you will be able to pronounce any word in this index.

ā	as in tāke	ē	as in mē	ŏ	as in bŏx	o͝o	as in bo͝ok
â	as in câre	ĕ	as in sĕt	ô	as in fôr	oi	as in oil
ă	as in măn	ẽ	as in rivẽr	ū	as in ūse	ou	as in out
ȧ	as in ȧsk	ī	as in fīnd	ŭ	as in bŭt	th	as in bath
ä	as in fär	ĭ	as in hĭm	û	as in bûrn	*th*	as in ba*th*e
ȧ	as in sof*ȧ*	ō	as in gō	o͞o	as in so͞on	zh	as in pleasure

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